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Current issue online at http://www-als.lbl.gov/als/als_news/

1. CONTINUING RESOLUTION UPDATE

by Roger Falcone

(Contact: RWFalcone@lbl.gov)

The ALS and other Department of Energy (DOE) user facilities continue to view with concern the current state of the budget for DOE's Office of Science. New congressional leaders have indicated that fiscal year (FY) 2007 budgets, in which the Office of Science was expected to receive a major increase, may be held at FY06 levels. As you probably have heard, at the ALS this will mean foregoing the hiring of new beamline scientists and other personnel, together with major delays in new projects and lower than needed expenditures on maintenance; other DOE laboratories and facilities are looking at similar or worse scenarios. We are keeping our leadership in Washington informed about the impact of this so-called Continuing Budget Resolution on the user programs at the ALS. Importantly, users have also been communicating with their congressional representatives in the hope that Congress will pass a FY07 budget that reflects the intent of both the executive and congressional branches, expressed last year, to fully fund the Office of Science.

Editors' Note: Developments occurring at press time in the House of Representatives ("U.S. House Throws Science a Lifeline") can be viewed at <http://sciencenow.sciencemag.org/cgi/content/full/2007/130/1> .

2. THE INITIATION OF BACTERIAL DNA REPLICATION

(Contact: James Berger, jmberger@calmail.berkeley.edu)

For the first time, scientists have determined the structure of the initiator of bacterial DNA replication. It is already known that such replication is controlled by a protein known as DnaA, a member of the AAA+ superfamily of ATPases. What has now been discovered is that the core of the initiator is not the closed-ring structure expected for this system. Instead, DnaA forms an open right-handed helix. In addition, the architecture indicates that this AAA+ superhelix will wrap coils of the DNA around its exterior, causing the DNA double helix to deform as a first step in the separation and unwinding of its strands. Eukaryotic and archaeal initiators also have the structural elements that promote open-helix formation, indicating that a spiral, open-ring AAA+ assembly is a conserved element from a common evolutionary ancestor of Archaea, Bacteria, and Eukarya.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/136ATP_DnaA.html

Publication about this research: J.P. Erzberger, M.L. Mott, and J.M. Berger, "Structural basis for ATP-dependent DnaA assembly and replication-origin remodeling," *Nat. Struct. Mol. Biol.* 13, 665 (2006).

3. TOP-OFF UPGRADE AND OPERATION STATUS

(Contacts: Steve Rossi, SLRossi@lbl.gov, and Christoph Steier, CSteier@lbl.gov)

This was the longest shutdown for the ALS since it began operations in 1993. The focus was on the installations necessary for the upgrade to top-off injection. However, there were many other significant tasks accomplished as well. Largely the work went well and was completed on time. However, on December 15th there was a serious failure in the booster dipole power supply during testing by the power supply vendor. We therefore implemented several contingency plans, including reinstallation of the old bend power supply in parallel with the new supply. This enables us to switch back and forth between the supplies to allow for the repair, completion, and full commissioning of the new supply, and is an option should the new supply experience another failure. Despite this setback, user operations resumed on January 17th. With the completion of this shutdown and commissioning period, the major hardware work for the top-off upgrade is completed. We hope to receive regulatory approval for top-off operation this summer or fall, and begin top-off operation immediately thereafter. Read the full article at http://www-als.lbl.gov/als/als_news/news_archive/vol.272_013107.html#3.

4. SAC REVIEWS THE YEAR AND LOOKS AHEAD

(Contact: Roger Falcone, RWFalcone@lbl.gov)

Members of the ALS Scientific Advisory Committee (SAC) met at Berkeley Lab on December 14 and 15 to hear about the latest ALS initiatives, projects and upgrades and to advise management on a variety of issues, including recommendations of the Program Study Panel,

plans for accelerator renewal, and progress on a next-generation light source. Berkeley Lab Associate Laboratory Director Paul Alivisatos welcomed the attendees and introduced the new ALS director, Roger Falcone, who acknowledged that the year had brought several organizational changes, among them, sadly, the sudden loss of our colleague Neville Smith. He then brought the committee up to date on recent developments, including the ALS Users' Meeting, safety issues, optimizing beamline staffing, and progress toward facility improvements and beamline development. He also stressed that the ALS presence continues to increase--publications are up, there are more general user proposals, and there are more users.

Ben Feinberg (ALS Deputy Division Director) then introduced three Laboratory Directed Research and Development (LDRD)-funded ALS projects. Principal Investigators Andreas Bartel, Michael Martin, and Alexander Hexemer provided brief overviews. This was followed by a short presentation and discussion on the Program Study Panel report by Peter Johnson of Brookhaven National Laboratory. After lunch, the meeting focused on accelerator renewal issues. David Robin (Accelerator and Fusion Research Division, AFRD) provided the overview, Christoph Steier (AFRD) gave the top-off upgrade status, Greg Portmann (Engineering) discussed single-bunch kicking, Ken Baptiste (Engineering) focused on klystron replacement, and David Robin (AFRD) concluded with a presentation on a higher-brightness lattice.

The afternoon ended with an overview and discussion of the next- generation light source by Roger Falcone and an accelerator research and development proposal by John Corlett (AFRD). The second day's session focused on the proposed environmental science infrared beamline (Michael Martin, ALS, and Peter Nico, Earth Sciences Division), the QERLIN momentum-resolved spectroscopy technique (Zahid Hussain, ALS, and Zahid Hasan, Princeton University), and a summary of a recent review of the protein crystallography beamlines (Keith Moffat, University of Chicago). Gary Krebs and Janos Kirz (ALS) then concluded the meeting with a presentation on upcoming beamline reviews. Viewgraph presentations (<http://www-als.lbl.gov/2006sac/>) and a listing of current SAC members (<http://www-als.lbl.gov/als/ourorg/sac.html>) are available online.

5. UEC CORNER: NOTES FROM THE USERS' EXECUTIVE COMMITTEE

(Contact: Tony van Buuren, vanbuuren1@llnl.gov)

The ALS Users' Executive Committee (UEC) conveys the concerns and interests of users to ALS management. Members are elected annually by ALS users. The UEC also facilitates communication between the ALS and other synchrotrons and between users and federal funding agencies.

As Roger mentions above, a \$500 million increase for the Office of Science proposed by the President and approved by the House of Representatives could very well be lost when Congress adopts a Continuing Resolution for the entire 2007 fiscal year. This budget scenario will have a significant effect on efforts to appropriately support users with scientific and engineering staff, plans to replace aging instruments, and the ALS strategy to develop and implement new scientific capabilities.

As the new chair of the Users' Executive Committee, I want to extend an invitation to all users to contact the members of the UEC with concerns or questions regarding the ALS Users' Group. We are here to support your needs, so please contact me (avanbuuren@ucmeced.edu) or anyone else on the UEC with any questions.

The current members of the committee (with terms) are listed below:

Tony van Buuren (chair), Lawrence Livermore National Laboratory
(2005-07)

Elke Arenholz, Advanced Light Source, Berkeley Lab (2006-08)

Peter Fischer, Center for X-Ray Optics, Berkeley Lab (2007-09)

Kenneth Goldberg, Center for X-Ray Optics, Berkeley Lab (2007-09)

Jinghua Guo, Advanced Light Source, Berkeley Lab (2005-07)

Clemens Heske (past chair), Univ. of Nevada, Las Vegas (2004-06)

Franz Himpsel, Univ. of Wisconsin, Madison (2007-09)

Amanda Hudson, Univ. of Nevada, Las Vegas (2005-07)

Alessandra Lanzara, Univ. of California, Berkeley; Materials Sciences Division, Berkeley Lab
(2006-08)

Simon Morton, Physical Biosciences Division, Berkeley Lab (2005-07)

Hendrik Ohldag (vice chair), Stanford Synchrotron Radiation Laboratory (2006-08)

Contact information for all UEC members can be found at
<http://www-als.lbl.gov/als/uec/UECcontacts.html> .

The Users' Associations at the light sources across the country have formed a group to work on outreach and education to help ensure that people understand the importance of these facilities, and Corie Ralston is representing the ALS UEC in this activity. Please contact her at cyrstalston@sff.net with any questions or suggestions. We would very much like to thank Clemens Heske, who was Chair of the UEC last year, for all of his efforts, and Ed Westbrook and Greg Denbeaux, who rotated off the UEC this year.

Again, please don't hesitate to contact me with any questions or concerns. I look forward to meeting you and a productive and interesting year at the Advanced Light Source!

6. SAFETY FIRST: ALS RADIOLOGICAL WORK AUTHORIZATION APPROVED (Contact: Jim Floyd, JGFloyd@lbl.gov)

A revised Radiological Work Authorization (RWA) for the ALS has been reviewed, approved, and is now in effect. Careful controls are still in place for reviewing and implementing beamline shielding changes. Please contact John Pruyn at JMPruyn@lbl.gov if you have any questions regarding shielding or shielding changes at the beamlines. Following the fire at Sector 5, almost all of the affected light fixtures have either been removed or had new bulbs installed as an interim measure. The final plan is to replace all of the fixtures during our next shutdown.

With the upcoming demolition of Building 10, the User Chemistry Lab is relocating to 6-2233 on an interim basis. As this space is much smaller and is being generously shared by the Molecular Environmental Science program, work there will have to be coordinated and done more carefully. A new orientation packet has been prepared for users of that space that Donna Hamamoto is leading this effort, which will include more thorough training, orientation, scheduling, chemical inventory and waste management. gives an overview of their responsibilities. Work involving waste generation, prolonged use of the hood, hazardous gases, etc., will need to be reviewed and scheduled.

The ALS received its MESH (Management of Environment, Health, and Safety) review from the Safety Review Committee (SRC), and Roger Falcone gave the ALS response at the Committee's January meeting. All responses were accepted by the SRC. The ALS Staff Safety Committee has finished its investigation of the Beamline 5.3 radiation safety shutter issue and presented its findings to management. Although no definitive cause could be determined, a number of recommendations were made. Final corrective actions are still being decided upon.

7. COHERENCE 2007 WORKSHOP TO TAKE PLACE IN JUNE (Contact: Janos Kirz, jkirz@lbl.gov)

The fourth International Workshop on Phase Retrieval and Coherent Scattering will take place June 25-28, 2007, at the Asilomar Conference Center in Pacific Grove, California. This year's workshop, Coherence 2007, will focus on how coherent x rays from third-generation light sources and free-electron lasers are providing exciting opportunities for microscopy based on recording and reconstruction of diffraction patterns and for extending speckle correlation spectroscopy to the x-ray range. The workshop offers the chance to review recent progress and exchange ideas for future initiatives in these areas.

Previous workshops were held in Berkeley, France, and Australia. Sponsors for this year's meeting include Berkeley Lab's Advanced Light Source and Center for X-Ray Optics; Lawrence Livermore National Laboratory; XRADIA; and the University of California, Davis, Center for Biophotonics.

The deadline for abstract submissions is March 1, 2007. Information about abstract submissions, meeting registration, accommodations, and Monterey/Pacific Grove tourist activities is available at <http://www-als.lbl.gov/coherence2007/>.

8. JULIE MCCULLOUGH JOINS THE ALS EDITORIAL TEAM

In December 2006, Julie McCullough joined the ALS Technical Information Section staff, where her main beat is ALSNews. Although new to the ALS, she was lead writer and editor in the Berkeley Lab Public Affairs' Creative Services Office (formerly the Technical and Electronic Information Department) before taking time off to write her coming-of-age novel about a girl growing up in New Orleans. Julie welcomes your feedback and suggestions for ALSNews. You can reach her at jmccullough@lbl.gov or x6838. Her office is in Building 4, Room 221.

9. PLEASE REPORT ALS PUBLICATIONS BY FRIDAY, FEBRUARY 9

(Contact: alsuser@lbl.gov)

If you have recently published any ALS-related work in a scientific journal, conference proceedings, or book chapter, completed a Ph.D. thesis, or received a patent based on work done at the ALS, please let us know by February 9th.

Simply go to the User Services Publications Web page at <http://www-als.lbl.gov/als/quickguide/userpubs.html>. From there, it is an easy two-step process: (1) Do a "Search for Publications" to see if your publications were previously entered into our database by a collaborator. If you are one of our more prolific publishers or have a common last name, you can limit the search by initials, beamline, year published, or journal name. (2) For your publications that are not reported in our database, fill out the "ALS Publications Submission" form. This works best if you use Netscape 6 or 7, Microsoft Internet Explorer version 5.0 or greater, or Safari 2.0 (Macs only) or greater; otherwise, you will lose data if you hit the "Back" key. Most of the mandatory fields are required by DOE. The most important fields are "Title" and "Journal or Publication Name." If you are missing information, such as the specific page or month published, please type "n/a" in the field; we will attempt to track it down.

Your timely response will be greatly appreciated, as it is imperative that we accurately track the publications we generate. Remember, if it's on your CV, and all or part of the work was done at the ALS, it should be in our database!

10. ALS-RELATED WEB NEWS AND LINKS

Memories of an interesting character, Neville Smith remembered
<http://www-als.lbl.gov/als/usermtg/nevilleMemoryBook.pdf>

A comet comes to the Advanced Light Source
<http://www.lbl.gov/Science-Articles/Archive/sabl/2007/Jan/ALS-comet.html>

Synchrotrons help reveal the nature of comets
<http://www.physorg.com/news85767192.html>

UC Berkeley researchers developed techniques to pluck comet dust from Stardust collectors
http://www.eurekalert.org/pub_releases/2006-12/uoc--ubr121406.php

Discovery of new possibilities for magnetic storage
<http://www.nanowerk.com/news/newsid=1075.php>

A boost for hydrogen fuel cell research
<http://lightsources.org/cms/?pid=1001894>

Zooming in on a molecular relay
<http://www.hhmi.org/news/schulman20070114.html>

New "chemical factory" will help scientists understand red wine's beneficial effects
<http://www.hhmi.org/news/noel20061222.html>

Online class, Synchrotron Radiation for Materials Science Applications, taught by David Attwood
<http://www.coe.berkeley.edu/AST/srms/>

11. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs scheduled between January 17 and 28, the beam reliability (time delivered/time scheduled) was 89.9%. Of the scheduled beam, 76.3% was delivered to completion without interruption. Multiple problems with the injection system were the cause of most of the beam time lost.

Long-term and weekly operations schedules are available on the Web at <http://www-als.lbl.gov/als/schedules/index.html>. Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at <http://www-als.lbl.gov/als/status/>.

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ALSNews is a monthly electronic newsletter to keep users informed about developments at the Advanced Light Source, a national user facility located at Ernest Orlando Lawrence Berkeley National Laboratory, University of California. The current and past issues of ALSNews are available on the World Wide Web. Point your browser to the following URL:

http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

LBNL/PUB-948 (2007)

Editors: jmccullough@lbl.gov, lstamura@lbl.gov, ejmoxon@lbl.gov

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<http://www-library.lbl.gov/teid/tmRco/howto/RcoBerkeleyLabDisclaimer.htm>

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1. OFFICE OF SCIENCE FUNDING ENSURED

(Contact: Roger Falcone, RWFalcone@lbl.gov)

The funding situation for the ALS and other DOE facilities within the Office of Science looked particularly dire last month, as congressional leaders had indicated that fiscal year (FY) 2007 budgets, in which the Office of Science was expected to receive a major increase, might be held at FY06 levels. The ALS and other laboratories, universities, and Department of Energy facilities kept our leadership in Washington informed about these impacts, and users communicated with their congressional representatives in the hope that Congress would pass a FY07 budget that reflected the intent of both the executive and Congressional branches, expressed last year, to fully fund the Office of Science.

Recent indications are that these efforts have met with some success. Although we have not received an updated financial plan, our budget is expected be closer to the original FY07 levels rather than the FY06 levels. This should help us implement our plan for strong user support, to undertake needed maintenance, and to maintain momentum on important beamline projects. Thanks to all the members of the ALS user community who worked to make this happen.

2. BEYOND THE LONE-PAIR MODEL FOR STRUCTURALLY DISTORTED METAL OXIDES

(Contact: Russell Egdell, russell.egdell@chemistry.oxford.ac.uk)

"Ferroelectricity," by analogy to ferromagnetism, is defined as the presence of spontaneous electrical polarization in a material, often arising from distortions in the material's crystal structure. In oxides of the metals lead and bismuth, such distortions were for many years attributed to the existence of "lone pair" electrons: pairs of chemically inert, nonbonding valence

electrons in hybrid orbitals that leave noticeable voids in the crystal structure. At the ALS, researchers from the U.K., Ireland, and the U.S. have now obtained definitive experimental evidence that this lone-pair model must be revised. High-resolution x-ray photoemission spectroscopy (XPS) and soft x-ray emission spectroscopy (XES) have clarified the subtle electronic origins of the prototypical distortions in these crystal structures. The results have important implications for the tantalizing possibility of spintronic or superconducting devices combining ferroelectric and ferromagnetic properties.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/138lonepair.html

Publication about this research: D.J. Payne, R.G. Egdel, A. Walsh, G.W. Watson, J. Guo, P.-A. Glans, T. Learmonth, and K.E. Smith, "Electronic origins of structural distortions in post-transition metal oxides: Experimental and theoretical evidence for a revision of the lone pair model," *Phys. Rev. Lett.* 96, 157403 (2006).

3. BREAKTHROUGH RESEARCH ON PLATINUM-NICKEL ALLOYS

(Contact: V.R. Stamenkovic, vrstamenkovic@anl.gov)

Two out of three of the kinetic barriers to the practical use of polymer electrolyte membrane (PEM) hydrogen fuel cells in automobiles have been breached: the impractically high amount of extra energy needed for the oxidation reduction reaction (ORR) on the catalyst, and the loss of catalytic surface areas available for ORR. Using a combination of probes and calculations, a group of scientists has demonstrated that the Pt₃Ni(111) alloy is ten times more active for ORR than the corresponding Pt(111) surface and ninety times more active than the current state-of-the-art Pt/C catalysts used in existing PEM fuel cells. This new variation of the platinum-nickel alloy is the most active oxygen-reducing catalyst ever reported.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/139cathode.html

Publication about this research: V.R. Stamenkovic, B. Fowler, B.S. Mun, G. Wang, P.N. Ross, C.A. Lucas, and N.M. Markovi, "Improved oxygen reduction activity on Pt₃Ni(111) via increased surface site availability," *Science* 315, 5811 (2007).

4. LOOKING INSIDE THE PLANT CELL FOR BIOFUEL ANSWERS

(Contact: Paul Adams, PDAdams@lbl.gov)

This month, global energy firm BP selected a Berkeley Lab/UC Berkeley/University of Illinois consortium to lead a \$500 million research effort to develop new sources of energy and reduce the impact of energy consumption on the environment. The funding will create the Energy Biosciences Institute (EBI), which initially will focus its research on biotechnology to produce biofuels--that is, turning plants and plant materials, including corn, field waste, switchgrass, and algae, into transportation fuels.

Basic research will be a fundamental goal of the EBI: exploring how the cell wall is made in plants, how cellulose can be best broken down, and developing new biological methods for the conversion of the cellulose to different fuels. Several important tools for these investigations are available at the ALS. According to Paul Adams, head of the Berkeley Center for Structural Biology, (<http://bcsb.lbl.gov/>) "Right now we don't have a detailed picture of what the plant cell wall looks like, but many of the tools are now becoming available. It will be possible to look at the structures of the cellular machinery that creates the cell wall, and also the enzymes that can be used to break it down." Protein crystallography (Beamlines 4.2.2, 5.0.1-5.0.3, 8.2.1, 8.2.2, 8.3.1, 12.3.1), small-angle x-ray scattering (Beamlines 7.3.3, 12.3.1), x-ray microdiffraction (Beamline 12.3.2), and scanning transmission x-ray microscopy (STXM) (Beamlines 5.3.2, 11.0.2) are some of the instruments at the ALS that could be used as part of this unprecedented research effort. In addition, Beamline 9.0.2 (the site of detailed flame and combustion research) could be an important resource for the EBI when it later turns its attention to testing the fuels the program is generating.

5. DEMOLITION OF BUILDING 10 SET TO BEGIN

(Contact: Steve Rossi, SLRossi@lbl.gov)

Building 10, a failing World War II-era structure on the southwest side of the ALS, is on schedule for demolition this spring to make way for a new User Support Building that will provide much-improved staging, lab, and office space for the ALS community. Previous occupants of Building 10, including the Chem Lab, User Shop, and Controls Group, have now all been relocated to alternate sites in and around the ALS.

The empty building will be turned over to the demolition contractor in March, at which time utility deactivation and abatement will begin. As a result of vibration testing done last fall, the actual heavy demolition and removal of the building and its foundations has been scheduled during the next ALS shutdown, from May 14 through June 26, to avoid vibration problems during user operations. During that time, parking along the roads around Buildings 10 and 80 will be affected, and exits from the ALS through Building 10 will be closed off. A Webcam will be set up on the site to monitor and record the demolition process. Joe Harkins is the demolition project director for Berkeley Lab, and Steve Rossi is the user representative. Please contact Steve (SLRossi@lbl.gov, 510-486-6793) with any questions or problems that may arise regarding the demolition.

6. ALS FLOOR OPERATORS ENSURE SAFETY

(Contact: John Pruyn, JMPruyn@lbl.gov)

Davy Xu and Matt Abreu recently joined the ALS as floor operators. Both hail from the East Bay, Davy by way of Martinez and UCLA, and Matt by way of Castro Valley and UC Berkeley. As a boat mechanic, Matt was able to work on mechanical systems at the peak of their performance. His physics degree and mechanical experience are a good combination for the precise demands of his new position. Davy was first attracted to nuclear engineering and physics

in middle school, and working at the ALS is the fulfillment of a long-held fantasy to work at a DOE lab. When asked what stood out for them most in their new jobs, Matt replied, "Everyone is so friendly. People who don't have time to take, take time." Davy agreed, and added "This place is huge. There was nothing like it at UCLA. I can't believe I get paid to do this."

As floor operators, Matt and Davy help to ensure operational safety of the beamlines. A major part of this is determining whether a beamline is ready to be brought online for the first time or brought back online through a detailed key-enabling procedure: checking for outstanding personnel safety and equipment bypasses, performing valid radiation and interlock tests, filling out active shielding change forms, and safety inspection of radiation shielding configuration, vacuum integrity, and fast valve systems. After the floor operator successfully executes these checks and the Experiment Safety Sheet is completed, they will enable the beamline for the users.

7. CALL FOR ABSTRACTS: COHERENCE 2007

(Contact: Janos Kirz, JKirz@lbl.gov)

This year's International Workshop on Phase Retrieval and Coherent Scattering (Coherence 2007) is the fourth in a series. The conference will be devoted to coherent x-ray physics, and three topics in particular will be considered: imaging with coherent x rays, dynamics via photon correlation, and opportunities with new sources. The meeting will take place June 25-28, 2007, at the Asilomar Conference Center, located on the beautiful Monterey Peninsula.

Meeting attendees are invited to submit a one-page abstract for consideration as an oral or poster presentation at Coherence 2007. Detailed instructions regarding format and submission procedures are available under "Abstracts" on the Coherence 2007 Web site. (<http://www-als.lbl.gov/coherence2007/abstracts.htm>) The deadline for abstract submissions is March 1, 2007.

More information about the meeting, registration, accommodation, and tourism in the Monterey Bay Area is available on the Coherence 2007 Web site (<http://www-als.lbl.gov/coherence2007/index.htm>).

8. ALS-RELATED WEB NEWS AND LINKS

Continuing Resolution Signed: Ensures Funding

<http://www.washingtonpost.com/wp-dyn/content/article/2007/02/14/AR2007021401287.html>

City Planners to Review LBNL Long Range Growth Plans

<http://www.berkeleydaily.org/text/article.cfm?Issue=02-20-07&storyID=26369>

Small Particles, Big Challenges

<http://www.designnews.com/index.asp?layout=article&articleid=CA6395314>

9. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs scheduled between January 31 and February 25, the beam reliability (time delivered/time scheduled) was 91.6%. Of the scheduled beam, 85.8% was delivered to completion without interruption.

Long-term and weekly operations schedules are available on the Web at <http://www-als.lbl.gov/als/schedules/index.html> . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at <http://www-als.lbl.gov/als/status/> .

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To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

LBNL/PUB-948 (2007)

Editors: jmccullough@lbl.gov, Istamura@lbl.gov, ejmoxon@lbl.gov

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Current issue online at http://www-als.lbl.gov/als/als_news/

1. MAGNETIC VORTEX CORE REVERSAL BY LOW-FIELD EXCITATIONS

(Contact: Hermann Stoll, stoll@mf.mpg.de)

In micrometer-sized magnetic thin films, the magnetization typically adopts an in-plane, circular configuration known as a magnetic vortex. At the vortex core, the magnetization turns sharply out of the plane, pointing either up or down. Magnetic data storage based on this binary phenomenon is an intriguing concept, but it would require the ability to flip the vortex cores on demand. Because these structures are highly stable, very strong magnetic fields of around half a tesla (approximately one-third the field of the strongest permanent magnet) were previously thought to be necessary to accomplish this. At the ALS, a team of researchers from Germany, Belgium, and the U.S. has used time-resolved scanning transmission x-ray microscopy (STXM) to observe vortex motion and demonstrate the feasibility of using weak magnetic fields as low as 1.5 millitesla (mT) to reverse the direction of a vortex core. The observed switching mechanism, which can be understood within the framework of micromagnetic theory, gives insights into basic magnetization dynamics and their possible application to data storage technologies.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/145vortex.html

Publication about this research: B. Van Waeyenberge, A. Puzic, H. Stoll, K.W. Chou, T. Tyliczszak, R. Hertel, M. Fahnle, H. Bruckl, K. Rott, G. Reiss, I. Neudecker, D. Weiss, C.H. Back, and G. Schutz, "Magnetic vortex core reversal by excitation with short bursts of an alternating field," *Nature* 444, 461 (2006).

2. OPTICAL UPGRADES INCREASE PERFORMANCE OF SECTOR 5 BEAMLINES

(Contact: Paul Adams, PGAdams@lbl.gov)

Beamlines 5.0.1, 5.0.2, and 5.0.3 have undergone a major upgrade in their optics--the most significant since their construction. During the upgrade, which was the culmination of two years of work, all of the internally water-cooled copper premirrors were replaced by slot-cooled silicon mirrors. As a part of this installation, new high-vacuum tanks with improved mirror-bending mechanisms were designed and installed.

This optical upgrade has significantly improved the performance of the Sector 5 beamlines, which use x rays from the W16 wiggler. A five- to tenfold improvement in available flux has been achieved at the side-station beamlines (5.0.1 and 5.0.3), which now generate 1.5×10^{11} photons per second at 12.4 keV. The performance of 5.0.2 (the tunable beamline) was improved by a factor of 3 to 4. It now generates 8×10^{11} photons per second at 10 keV at 400-mA ring current, which surpasses even the theoretical maximum performance of the macromolecular superbend beamlines at the ALS. The upgrade has also extended the energy range of 5.0.2 to 17 keV, enabling the routine use of shorter wavelengths and anomalously scattering elements such as bromine. This recent work has been part of a series of upgrades, started in 2004, that has increased the flux overall of all Sector 5.0 beamlines by a factor of 20.

This upgrade, funded by the ALS and Berkeley Lab, was performed by the staff of the Berkeley Center for Structural Biology, ALS Experimental Systems Group, and ALS Engineering. Those involved include Simon Morton, Jeff Dickert, and John Taylor (Berkeley Center for Structural Biology); Howard Padmore and James Glossinger (ALS Experimental Systems Group); and Rob Duarte, John Pepper, Pat McKean, and Alexis Smith-Baumann (Engineering Division).

3. USERS BENEFIT FROM RESTRUCTURING OF ALS BEAMLINE COORDINATION GROUP

(Contacts: Gary Krebs, GFKrebs@lbl.gov, and Donna Hamamoto, DJHamamoto@lbl.gov)

The old ALS Beamline Coordination Group has been divided into two groups, Experimental Setup Coordination, which is in the User Services Group, and Floor Operations, which is in the Operations Group. The ALS believes the two new groups working together will afford greater coverage and assistance to users in both access to and safety at the ALS. The Experimental Setup Coordination group consists of Donna Hamamoto and David Malone. They make early contact with experimenters to confirm the samples and hardware for each experiment, coordinate Experiment Safety Sheet inspections for new and returning experiments, and serve as the main point of contact for experiment-related needs. The group also provides assistance with the setup of toxic gases, ALS Chemistry Lab access, and waste disposal. Users should contact Donna (DJHamamoto@lbl.gov) or David (DJMalone@lbl.gov) anytime regarding the addition of new samples, equipment, and people to their experiments.

Complementing and working closely with the Experimental Setup Coordinators are the Floor Operators (see "ALS Floor Operators ensure safety," ALSNews Vol. 273, http://www-als.lbl.gov/als/als_news/news_archive/vol.273_022807.html#6), whose primary function is to

oversee the safety of the beamlines. Floor Operations provides beamline key enable and shielding integrity assistance and, once fully staffed, also will provide off-shift safety oversight. The Floor Operations group consists of John Pruyn (JMPruyn@lbl.gov), Matthew Abreu (MJAbreu@lbl.gov), and Davy Xu (DXu@lbl.gov).

4. SAFETY FIRST: BE AWARE OF CONSTRUCTION SITE BOUNDARIES

by Roger Falcone

(Contacts: Roger Falcone, RWFalcone@lbl.gov, and Jim Floyd, JGFloyd@lbl.gov)

It is extremely important for all ALS staff and users to recognize the construction site boundaries of the User Support Building (USB) project. These boundaries are now very clearly marked with fencing or caution tape and signs. Only authorized individuals with hard hats, etc., are allowed into the construction zone. If you are not a part of the project, you must respect this boundary and stay out at all times. In addition to the inherent safety risk to people, unauthorized access adds risk to the project and could shut it down. Neither of these risks can be tolerated, and any individual found violating this policy will be subject to appropriate action under Berkeley Lab policy.

See "Demolition of Building 10 set to begin," ALSNews Vol. 273 at http://www-als.lbl.gov/als/_news/news_archive/vol.273_022807.html#5 for more information on this construction. The Berkeley Lab Site Map at <http://isswprod.lbl.gov/labmap/labmap.htm> provides the Building 10 demolition/USB construction location.

5. IN MEMORIAM: THE ALS REMEMBERS AL BAEZ AND JIM PATEL

ALBERT V. BAEZ, noted physicist, humanitarian, educator, and member of the ALS user community, died on March 20, 2007, at the age of 94. He was the father of folk singers Joan Baez and the late Mimi Fariña. Al was born in Puebla, Mexico. He received his Ph.D. from Stanford University in California. There, in 1948, he and Paul Kirkpatrick pioneered grazing incidence mirrors to focus x rays. A focusing geometry using two grazing incidence mirrors mounted perpendicular to each other is known as the Kirkpatrick-Baez geometry. Berkeley Lab's Center for X-Ray Optics pioneered the use of this system at x-ray synchrotrons. In 1993 the first beamline at the ALS (10.3.1) used a Kirkpatrick-Baez mirror system. Al was also the person who first suggested the use of Fresnel zone plates with ultraviolet light and soft x rays, and demonstrated their use in the ultraviolet. As the first director of its science-teaching division, Al worked with UNESCO from 1961 to 1967. Also, he spent a year in Baghdad building a university physics laboratory. In 1967, he wrote *The New College Physics: A Spiral Approach*, a physics textbook. As a life-long pacifist and Quaker, Al opposed the Vietnam War and was active in many peace and humanitarian programs. He served as president of *Vivamos Mejor* (Let Us Live Better), which is dedicated to improving the quality of life through science-based education and community-development projects in Latin America. "In all aspects of his life, he combined personal and professional roles as scientist, environmentalist, teacher, and humanitarian. In doing so, he nurtured and conveyed values representing mankind at its best," the Baez family said in a statement.

JAMSHED (JIM) R. PATEL, ALS user and dear colleague to many, died on March 3, 2007, at his home in Menlo Park at the age of 81. Jim received his master's degree in mechanical engineering and Ph.D. in metallurgy in his native India. After working in the Materials Sciences Division at Bell Laboratories for many years, Jim moved to California in 1994, where he held a joint position at the ALS and SSRL/SLAC Stanford University. A Fellow of the American Physical Society, he also held numerous visiting and consulting positions at several international science institutions including the Universite Pierre et Marie Curie in Paris, France; the NSLS (Brookhaven); CHESS (Cornell); and Intel Corporation in Santa Clara. At the ALS, Jim was instrumental in developing a successful x-ray microdiffraction program at Beamline 7.3.3, providing the initial funding through his position as a consultant at Intel. He initiated many of the materials sciences applications for the beamline, including the study of electromigration-induced plasticity in interconnect test structures and strain measurements at grain and domain boundaries in superconducting alloys. Jim worked tirelessly on this project until last summer, when he became ill. Even then, he stayed active until his very last day, reading articles and writing his monograph on the technique and application of synchrotron x-ray microdiffraction. Jim was a true gentleman of science, quiet and unassuming with the keenest of intellects, but always with the time to help and encourage his colleagues. He made a deep impression on anyone who knew him, and he will be sorely missed by all.

Our thoughts go out to Al's and Jim's families and friends throughout the world.

6. AMERICAN PHYSICAL SOCIETY AWARDS GO TO FRANZ HIMPSEL AND SAM BADER

FRANZ HIMPSEL has won the American Physical Society's Davisson-Germer Prize "for pioneering investigations of the electronic structure of surfaces, interfaces, adsorbates, and nanostructures." Himpfel has been a long-time involved and dedicated ALS user. He was a part of the lobbying for the ALS, was among the team that built one of the first two undulator beamlines, and later took part in the development of a nano-NEXAFS endstation at Beamline 8.0. He served on the ALS Science Policy Board and was just elected to the ALS Users' Executive Committee. Himpfel is a pioneer in the field of surface science using synchrotron radiation. After receiving his Ph.D. in physics from the University of Munich, he spent almost two decades at IBM Research before joining the University of Wisconsin-Madison as a physics professor in 1995. He is also a long-time user of the Synchrotron Radiation Center (SRC) in Madison and served as its Scientific Director from 1997 to 2002. More information can be found at <http://www.aps.org/programs/honors/prizes/prizerecipient.cfm?name=Franz%20Himpfel>

SAM BADER, member and past chair of the ALS Scientific Advisory Committee, received the 2007 David Adler Lectureship Award for his "spirited lectures, writing and experimental research in the area of nanomagnetism, magnetic films, multilayers and surfaces of metallic systems, including championing the surface magneto-optic Kerr effect approach." The award was presented at the March meeting of the American Physical Society (APS), where Bader gave an invited talk in the awards session of the Division of Materials Physics. Bader is an Argonne Distinguished Fellow and currently serves as Chief Scientist of the new Center for Nanoscale

Materials and as Associate Division Director and group leader in Argonne's Materials Science Division. He is a Senior Fellow and Deputy Director of the University of Chicago-Argonne Consortium for Nanoscience and holds adjunct professorships in the Department of Materials Science and Engineering at the University of Illinois, Urbana-Champaign, and in the Department of Physics and Astronomy at Northwestern University. He received the 1992 DOE-BES Award in Solid State Physics for work on coupled magnetic layers, the 1994 University of Chicago Award for Distinguished Performance at Argonne, and the 2001 AVS Thornton Award for "surface and thin film magnetism." More information can be found at <http://www.aps.org/programs/honors/awards/adler.cfm>

7. 9/11 DUST ANALYZED BY ALS USER TOM CAHILL FOR ESQUIRE MAGAZINE

University of California, Davis, professor and ALS user Tom Cahill is featured in the April edition of Esquire magazine. He was asked by writer Eric Gillin to analyze the dust particles on a messenger bag that Gillin was carrying in downtown New York when the World Trade Center Towers fell on September 11, 2001. After storing the bag for five years, Gillin's curiosity about the contents of the dust led to Dr. Cahill, UC Davis, and the ALS. Read the full story online at the Esquire Web site, http://www.esquire.com/9_11bag , or download the PDF at <http://www-als.lbl.gov/als/news/Print%20The%20Bag.pdf>

8. REGISTER NOW FOR COHERENCE 2007

(Contact: Janos Kirz, JKirz@lbl.gov)

Anyone planning on attending the Coherence 2007 Conference at the Asilomar Conference Center, June 25-27, is encouraged to register by Sunday, April 15, to take advantage of reduced registration fees. April 15 is also the deadline for reserving accommodations at Asilomar. The conference, fourth in a series, will be devoted to coherent x-ray physics. Three topics will be featured: imaging with coherent x rays, dynamics via photon correlation, and opportunities with new sources. For more information about the meeting, including a preliminary agenda, invited speakers, contacts, and tourism opportunities in and around the Monterey peninsula, see the Coherence 2007 Web site at <http://www-als.lbl.gov/coherence2007/> .

9. ALS-RELATED WEB NEWS AND LINKS

Bacterial Walls Come Tumbling Down

<http://www.hhmi.org/news/strynadka20070309.html>

Driving Down the Greener Road

http://www.gairrhudd.com/science_environment/838/driving-down-the-greener-road/

New Nanoscale Engineering Breakthrough Points To Hydrogen-powered Vehicles

<http://www.sciencedaily.com/releases/2007/03/070305140927.htm>

10. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs scheduled between February 26 and March 26, the beam reliability (time delivered/time scheduled) (including two-bunch user operations from March 14-25) was 87.6%. Of the scheduled beam, 83.9% was delivered to completion without interruption. Multiple problems during two-bunch operations were the cause of most of the beam time lost.

Long-term and weekly operations schedules are available on the Web at <http://www-als.lbl.gov/als/schedules/index.html> . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at <http://www-als.lbl.gov/als/status/> .

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ALSNews is a monthly electronic newsletter to keep users informed about developments at the Advanced Light Source, a national user facility located at Ernest Orlando Lawrence Berkeley National Laboratory, University of California. The current and past issues of ALSNews are available on the World Wide Web. Point your browser to the following URL:

http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

LBNL/PUB-948 (2007)

Editors: jmccullough@lbl.gov, lstamura@lbl.gov, ejmoxon@lbl.gov

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Current issue online at http://www-als.lbl.gov/als/als_news/

1. NIH DIRECTOR VISITS THE ALS

(Contact: Roger Falcone, RWFalcone@lbl.gov)

On March 31st, the Director of the National Institutes for Health (NIH), Elias Zerhouni, visited Berkeley Lab and the UC Berkeley campus. As part of his visit, he toured the ALS and reviewed NIH-funded research resources with Graham Fleming (Berkeley Lab Deputy Director), Roger Falcone (ALS Director), Paul Adams (Head of the Berkeley Center for Structural Biology, sectors 8.2 and 5.0 beamlines), and Carolyn Larabell (Director of the National Center for X-Ray Tomography, NCXT, beamline 2.1). The Berkeley Center for Structural Biology has five beamlines optimized for macromolecular protein crystallography. The NCXT carries out research in biological and biomedical imaging and cell biology.

Director Zerhouni's tour of the Berkeley Center for Structural Biology beamlines included a look at beamline 5.0.3's new 315r CCD detector and the Berkeley Automounter System (developed by Thomas Earnest and colleagues at Berkeley Lab). Dr. Adams described the upcoming upgrades to the 8.2.1 and 8.2.2 beamlines, and Dr. Zerhouni responded enthusiastically about the prospects for increased automation of crystallographic experiments.

As part of his tour, Director Zerhouni also inspected the NCXT's newly constructed soft x-ray microscope. This is the first such microscope to be designed and built specifically for biological and biomedical imaging. Dr. Zerhouni, a radiographer with considerable experience in full-body CAT scanning, was enormously enthusiastic about the potential of the new technique and told the assembled group, "I love this stuff!" Nearing the end of the NCXT tour, Mark Le Gros, the Berkeley Lab scientist responsible for the design and construction of the new microscope, showed Director Zerhouni his latest innovation, an instrument for a technique known as correlated microscopy.

At the end of the tour, Director Zerhouni, with overall responsibility for the NIH's \$29 billion budget, beamed and said "this was money well spent."

2. LASER SEEDING YIELDS HIGH-POWER COHERENT TERAHERTZ RADIATION (Contact: Fernando Sannibale, FSannibale@lbl.gov)

Researchers at Berkeley Lab have been exploring the ways coherent synchrotron radiation (CSR) is generated in electron storage rings when femtosecond lasers are used to carve out ultrafast x-ray pulses by femtoslicing (see previous highlight published in ALSNews Vol. 271, "Tailored terahertz pulses from a laser-modulated electron beam," at http://www-als.lbl.gov/als/als_news/news_archive/vol.271_112906.html). In their most recent work, the researchers reported the first observation of seeding an instability of the electron beam by the laser, and they presented a physical model that shows how this occurs under the proper conditions. Such a mechanism makes it possible to control the instability onset and to exploit its gain for the generation of pulses of terahertz CSR of unprecedented power. Terahertz radiation with a wavelength from about 1 cm to about 100 microns between the microwave and the infrared would provide access to a large number of fundamental phenomena. To mention only some of them: excited electrons orbit, small molecules rotate, proteins vibrate, superconducting energy gaps resonate, and gaseous and solid-state plasmas oscillate at terahertz frequencies. But generating terahertz radiation is ordinarily a challenging task for any kind of source, including storage-ring-based synchrotron light sources. The new findings by the ALS group could represent a significant step toward satisfying the need for powerful terahertz sources.

Read the full story at
http://www-als.lbl.gov/als/science/sci_archive/142lasermbi.html

Publication about this research: J.M. Byrd, Z. Hao, M.C. Martin, D.S. Robin, F. Sannibale, R.W. Schoenlein, A.A. Zholents, and M.S. Zolotarev, "Laser seeding of the storage-ring microbunching instability for high-power coherent terahertz radiation," *Phys. Rev. Lett.* 97, 074802 (2006).

3. CONTROLLING GRAPHENE'S ELECTRONIC STRUCTURE (Contact: Eli Rotenberg, ERotenberg@lbl.gov)

Graphene, because of its unusual electron properties, reduced dimensionality, and scale, has enormous potential for use in ultrafast electronic transistors. It exhibits high conductivity and an anomalous quantum Hall effect (a phenomenon exhibited by certain semiconductor devices at low temperatures and high magnetic fields). Among its novel properties, graphene's electrical charge carriers (electrons and holes) move through a solid with effectively zero mass and constant velocity, like photons. Graphene's intrinsically low scattering rate from defects implies the possibility of a new kind of electronics based on the manipulation of electrons as waves rather than particles. The primary technical difficulty has been controlling the transport of electrical charge carriers through the sheet. This area of research is known as bandgap engineering. While bandgap engineering is the basis of semiconductor technology, it is only now

being applied to graphene. Using angle-resolved photoemission spectroscopy (ARPES) at ALS beamline 7.0.1, a team of scientists from the ALS and Germany characterized the electronic band structure and successfully controlled the gap between valence and conduction bands in a bilayer of graphene thin films deposited on a substrate of silicon carbide. This was done by doping one sheet with adsorbed potassium atoms, creating an asymmetry between the two layers.

Publication about this research: Taisuke Ohta, Aaron Bostwick, Thomas Seyller, Karsten Horn, Eli Rotenberg, "Controlling the Electronic Structure of Bilayer Graphene," Science 313, 5789 (2006).

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/140graphene.html

4. USER SERVICES OFFICE PROVIDES SEAMLESS LINK TO ALS AND LAB (Contacts: Gary Krebs, GFKrebs@lbl.gov, and Jeff Troutman, JPTROUTMAN@lbl.gov)

The goal of the User Services Office is to provide a seamless interface between the user and the ALS and Berkeley Lab while ensuring the highest safety standards. This six-member team offers the following administrative services to the users during their stay. Proposals: General sciences user proposals are administered by the User Services Office twice a year. The Office also administers the protein crystallography proposals, with reviews on a bimonthly basis. The administrative person for proposals is Carmen Escobar. See the Proposals Web page at <http://www-als.lbl.gov/als/quickguide/independinvest.html> for more info on submitting proposals. Beamtime Allocation: Carmen administers the beamtime allocation and notification processes. Users Meetings and Conferences: Carmen is the lead for the Annual ALS Users' Meeting, with support from the rest of the office. Guest Processing: When users first come to the ALS, they are greeted in the mezzanine by Sharon Fujimura or Olga Poblete. They provide users with assistance in registration, badging, and basic safety training. Olga also helps users through the parking permit process. Apartments: Ken Winters is in charge of the ALS apartments and publications. Travel and Stipends: Valerie Wysinger is in charge of stipends, invitation letters for visas, and office space assignments. The User Services Administrator is Jeff Troutman. He is responsible for administrative workforce management and planning of the User Services Office, developing long-term running schedules, planning for User Executive Committee meetings, and BES Reporting. In addition, the User Services Office administers critical databases for users to record their experiments and publications: End-of-Run Reports: Upon completion of every experiment, every experimenter must complete an end of run report --

http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/EndofRunReport1.shtml/Initialize . Publications: In addition, all publications resulting from experiments or work done at the ALS are recorded by the User Services Office for the Department of Energy (DOE), after the user adds his or her publication to the database at

http://alsusweb.lbl.gov/4dcgi/web_getform/publicationssubmit.shtml/initialize .

The ALS Users Services Office, located in the mezzanine of Building 6 (room 2212), is open from 8 a.m. to noon, and 1 to 5 p.m. Stop by, or contact them by phone (510-486-7745) or email (alsuser@lbl.gov). Other user resources include the User Services Office Web page, <http://www->

als.lbl.gov/als/quickguide/useroffice.html , and the User Guide, <http://www-als.lbl.gov/als/quickguide/> .

5. MEMORIAL SERVICE FOR JIM PATEL

Last month, Jamshed (Jim) R. Patel, ALS user and dear colleague to many, died at his home in Menlo Park at the age of 81. Jim was one of the key players in the development of x-ray microdiffraction at the ALS, and his sharp mind and kind and gentle nature will be deeply missed. A memorial service will be held for Jim on Saturday, June 9th, at 3:00 p.m., at Saint Raymond's Catholic Church, located at 1100 Santa Cruz Avenue, Menlo Park, CA. All who wish to remember Jim are welcome to attend.

6. SAVE THE DATE: 2007 USERS' MEETING, OCTOBER 4-6

It's not too early to start planning to attend this year's ALS Users' Meeting. The meeting will be held on site at Berkeley Lab--from Thursday, October 4, to Saturday, October 6--and will offer a variety of invited talks, workshops, and selected science highlights. Ongoing facility projects such as top-off mode and the construction of the new ALS User Support and the ALS User Housing buildings will be discussed. The Topical Workshops are great opportunities to network, discuss recent successes, and combine efforts to address shared experimental challenges. The workshop topics are actively coming together now, and both suggestions and volunteer leaders are welcome. Please contact the UEC Meeting Chairs Peter Fischer (PJFischer@lbl.gov) and Ken Goldberg (KAGoldberg@lbl.gov) for additional information or if you are interested in proposing a workshop for the meeting.

7. ALS-RELATED WEB NEWS AND LINKS

Building the Nuclear Pore Piece by Piece
<http://lightsources.org/cms/?pid=1002081>

Judges Take Crash Course at laboratory
http://www.contracostatimes.com/search/ci_5555251

8. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs scheduled between March 27 and April 23, the beam reliability (time delivered/time scheduled) was 94.6%. Of the scheduled beam, 87.4% was delivered to completion. There were no significant interruptions.

Long-term and weekly operations schedules are available on the Web at <http://www-als.lbl.gov/als/schedules/index.html> . Requests for special operations use of the "scrubbing" shift

should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at <http://www-als.lbl.gov/als/status/> .

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To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

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Editors: jmccullough@lbl.gov, lstamura@lbl.gov, ejmoxon@lbl.gov

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1. PARTICLES FROM COMET P81/WILD 2 VIEWED BY ALS MICROSCOPES

(Contact: S.A. Sandford, ssandford@mail.arc.nasa.gov)

NASA's \$200-million, seven-year-long Stardust mission returned to Earth thousands of tiny particles snagged from the coma of comet 81P/Wild 2. Four ALS beamlines and the researchers using them were among the hundreds of scientists and dozens of experimental techniques in facilities around the world that contributed to the preliminary examination of the first samples. Adding to recent advances in cometary science showing the important role played by mixing of materials in the accretion disk where the planets of the Solar System had their birth, the first round of Stardust results suggests that the mixing started earlier in the planetary formation process and is more extensive than previously thought.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/141stardust.html

Publications about this research: D. Brownlee et al., "Comet 81P/Wild2 under a microscope," *Science* 314, 1711 (2006); S.A. Sandford et al., "Organics captured from Comet 81P/Wild 2 by the Stardust spacecraft," *Science* 314, 1720 (2006); L.P. Keller et al., "Infrared spectroscopy of Comet 81P/Wild 2 samples returned by Stardust," *Science* 314, 1728 (2006); G.J. Flynn et al., "Elemental compositions of Comet 81P/Wild 2 samples collected by Stardust," *Science* 314, 1731 (2006).

2. NATURE AND ORIGIN OF THE CUPRATE PSEUDOGAP

(Contact: Tonica Valla, valla@bnl.gov)

The workings of high-temperature superconductive (HTSC) materials are a mystery wrapped in an enigma. However, a team of researchers from the ALS, Brookhaven National Laboratory, and Cornell University has taken a major step in understanding part of this mystery--the nature and origin of the pseudogap. Using angle-resolved photoemission spectroscopy (ARPES) and scanning tunneling microscopy (STM), they have determined the electronic structure of $\text{La}^{2-x}\text{Ba}_x\text{CuO}_4$ (LBCO), a unique system in which superconductivity is strongly suppressed and static spin and charge orders develop near a doping level of $x = 1/8$.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/146cuprate_pseudogap.html

Publication about this research: T. Valla, A.V. Fedorov, J. Lee, J.C. Davis, and G.D. Gu, "The ground state of the pseudogap in cuprate superconductors," *Science* 314, 1914, (2006).

3. IN MEMORIAM: GARY KREBS

Gary Krebs, the popular leader of the ALS User Services Group, passed away suddenly on the evening of May 22 in the midst of travel to Long Island for his annual visit to attend the National Synchrotron Light Source (NSLS) user meeting at Brookhaven National Laboratory. When he missed his nightly telephone call home, his worried wife asked his hotel to check on him. The security manager entered his room and found Gary sitting peacefully in a chair with no sign of distress. In addition to his wife Kathy, he leaves behind one son, Matthew, and in Vancouver, British Columbia, a brother, Dennis, and his parents.

Since arriving at the ALS in 1993, Gary had major impacts in several important areas: bringing the nascent accelerator survey and alignment system into adulthood as a functioning, productive tool, leading the first Users Services Group as it evolved to serve an ever-larger user community, playing a significant role as the ALS representative (and recently becoming chair) to the Berkeley Lab Best Practices Diversity Council, and as the ALS representative to the Lab group that has been formulating plans for an on-site 60-room Berkeley Lab Guest House. For the last two years, he also served as Deputy Scientific Director to the late Neville Smith and then as Deputy Science Advisor to Janos Kirz.

ALS Director Roger Falcone remembers, "Gary had sincere dedication to the people of the ALS. His enthusiasm was palpable for important projects that could benefit both users and staff, such as the Guest House, the Lab diversity council, and support for visiting students, and we shared in his pleasure in his successes in this work. I will miss his ability to generously welcome users to the ALS, his skills in shepherding our review processes, and his wisdom in helping to lead the ALS for many years." Former Director Janos Kirz echoes these sentiments, "Over the past three years I had the privilege to work closely with Gary, and I learned a lot from him. He was devoted to the ALS, and in particular to the users of the ALS. He worked hard to make the Guest House a

reality, and his efforts are now bearing fruit. His passing is a great loss to all of us, and to me personally." Read the full article at <http://www-als.lbl.gov/als/news/krebs.html>

4. DIRECTOR'S UPDATE AT ALL-HANDS MEETING

(Contact: Roger Falcone, RWFalcone@lbl.gov)

At an all-hands meeting on Thursday, May 17, ALS Director Roger Falcone gave a comprehensive overview of the past nine months, the status of the ALS today, and its future direction. The meeting began with a safety update by Jim Floyd, ES&H Manager. Most of the Radiation Safety Committee corrective action items have been completed, and the rest will be finished by October; two new floor operators have been hired; and there are ongoing health and safety initiatives in many areas, including waste management, laser safety, and hazardous gases.

Roger announced a major organizational change--the addition of Peter Denes as ALS Deputy for Engineering, allowing for tighter coupling between ALS and the Engineering Division. He then reported on several significant upgrades--ultrafast Beamline 6.0.1, which achieved first light in April; Beamline 7.3.3 (SAXS/WAXS), whose initial data are very clean; and the Sector 5.0 mirror upgrade, bringing a five to tenfold flux increase to the side stations. The top-off upgrade team completed a successful technical review of the open shutter injection safety issue in April 2007. MERLIN is scheduled for installation this summer, and will provide the highest resolution capabilities for photoemission and inelastic scattering experiments. Two new projects will soon be underway: the Guest House, which begins construction this October, and the User Support Building, which begins construction in March 2008.

Roger pointed out that some of the most important science in new materials involves key research done at ALS beamlines. Recently, pure samples of carbon were made permanently magnetic at room temperature. Researchers used Beamline 11.0.2 to obtain images of the magnetized portions. At ALS Beamline 7.0.1, a team led by Eli Rotenberg characterized the electronic structure of and controlled the band gap in a bilayer of graphene. ALS Beamline 9.3.2 was involved in the discovery of a platinum-nickel alloy that is 90 times more active than existing state-of-the-art platinum catalysts. In conclusion, Roger emphasized that safety and frontier science remain the ALS's top priorities, and that the renewals and upgrades will ensure that the ALS continues to grow and the users continue to have a premier facility.

5. FIRST LIGHT FOR ULTRAFAST BEAMLINE 6.0.1

(Contact: Phil Heimann, PAHeimann@lbl.gov)

Beamline 6.0.1, the hard x-ray femtosecond beamline, passed its readiness review in early April. It had first light on April 23 during an accelerator physics shift. The beamline is based on a double-crystal monochromator and extends the photon energy range of Beamline 6.0 from 2 to 10 keV. Following first light, three weeks were devoted to beamline commissioning. The flux, energy resolution, spot size, and background for the electron-beam slicing technique were measured. During the May/June shutdown a chopper is being sent back to the manufacturer, Rigaku, to improve its vacuum performance. Also, chopper synchronization electronics are being

tested. After the shutdown, one further week of commissioning is scheduled as well as a first experiment to observe the mixing of infrared and x-ray photons in a diamond crystal. Ernie Glover (ALS) will lead the experiment.

Beamlines 6.0.1 (hard x rays) and 6.0.2 (soft x rays) are undulator beamlines, which are dedicated to time-resolved experiments on the femtosecond and picosecond time scales. They have 100 times the intensity/pulse, 10 times the repetition rate, and 10 times the energy resolution of bend magnet Beamline 5.3.1. Beamline 6.0.1 is designed for electron-beam slicing, which generates 200-fs x-ray pulses. On Beamline 6.0.2, picosecond dynamics have been observed in the x-ray absorption spectrum of a manganite crystal by a team including Matteo Rini and Bob Schoenlein (Materials Sciences Division, Berkeley Lab) and Andrea Cavalleri (Oxford).

6. COSMIC/MAESTRO REVIEWERS ENTHUSIASTIC

(Contacts: Tony Warwick, T_Warwick@lbl.gov, and Howard Padmore, HAPadmore@lbl.gov)

Tuesday May 1st saw the first technical review for the MAESTRO and COSMIC projects, which together will lead to the rebuilding of ALS Sector 7.0. Reviewers came from Berkeley Lab, ALBA in Spain, NSLS, and the Swiss Light Source, and were very enthusiastic, stating "We are unanimous in our belief that these conceptual designs will be turned into high performance, robust . . . beamlines."

COSMIC, which stands for Coherent Scattering and Diffraction Microscopy, will require two new beamlines for coherent imaging and scattering. These lines will deliver maximum coherent flux at modest spectral resolution and will employ horizontal dispersion. The spherical grating monochromators will select only the coherent fraction of the beam and operate independently for two separate endstations. Coherent imaging is being developed to employ x-ray illumination for lensless imaging using iterative techniques for phase retrieval and inversion of diffraction patterns to generate high-resolution images of objects microns in size. Coherent scattering is a related development with temporal and spatial correlations of speckle patterns used to watch phenomena such as phase transitions in magnetic materials, through scattering from domains. The experimental group includes Chris Jacobsen from Stony Brook University and Steve Kevan from the University of Oregon. For more information, see <http://www-als.lbl.gov/als/ourorg/strategicplan.pdf>.

MAESTRO, which stands for Microscopy and Electronic Structure Observatory, will require a new high-resolution low-energy beamline for high-resolution inelastic scattering and photoemission. The experimental group, led by Eli Rotenberg, will upgrade the current Electronic Structure Factory at Beamline 7.0 and add a new capability for ARPES with a zone plate focusing to smaller than 50 nm. The MAESTRO beamline will have a high-resolution collimated SX700 monochromator. This design offers high resolution without entrance slits, with an adjustable degree of tolerance for source size, thermal deformations, and polishing errors of the optics. Its use will be particularly appropriate following the implementation of top-off operation, when the vertical size of the source will be reduced.

7. USERS' MEETING, OCTOBER 4-6

The Users' Meeting will be held on site at Berkeley Lab--from Thursday, October 4, to Saturday, October 6--and will offer a variety of invited talks, workshops, and selected science highlights. Meeting organizers are delighted to announce that this year's plenary sessions will be held in conjunction with the Molecular Foundry's annual meeting. In addition, three of the twelve workshops planned for the meeting will be joint ALS/Molecular Foundry events designed to provide opportunities for future collaborations. Ongoing facility projects such as top-off mode and the construction of the new ALS user support and the ALS user housing buildings will be discussed. The topical workshops are great opportunities to network, discuss recent successes, and combine efforts to address shared experimental challenges. Please contact the meeting chairs Peter Fischer (PJFischer@lbl.gov) and Ken Goldberg (KAGoldberg@lbl.gov) for additional information.

8. GENERAL USER PROPOSALS SUBMISSION DEADLINE

(Contact: alsproposals@lbl.gov)

The User Services Office is accepting general user proposals from scientists who wish to conduct research in the general sciences at the ALS during the running period from January through June 2008. The deadline is July 15, 2007. (This deadline does not apply to protein crystallography proposals, which have a separate process and schedule.) To submit a new proposal, go to "ALS General User Proposal and Request for Beamtime" (see below). If you have an existing proposal for which you would like to receive beamtime during the January through June 2008 cycle, you must submit a Proposal Renewal Form. Scientists with active proposals have received instructions on how to submit proposal renewals. After review, the numeric rating of each proposal will be communicated to the PI, along with any comments from the external reviewers and the Proposal Study Panel. The cutoff rating for each beamline in the previous proposal cycle is published on the Web (see link below). The following resources are available for further information:

ALS User Services Administrator
alsuser@lbl.gov

General User Proposals
<http://www-als.lbl.gov/als/quickguide/independinvest.html>

ALS General User Proposal and Request for Beamtime
http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/Page1P.shtml/Initialize>

ALS Online Forms
<http://alsusweb.lbl.gov/>

Beamline Information

http://www-als.lbl.gov/als/als_users_bl/bl_table.html

General User Proposal Scores

<http://www-als.lbl.gov/als/quickguide/pspscores.html>

9. ALS FELLOWSHIP PROGRAM: DOCTORAL DEADLINE AND NEW POSTDOCTORAL FELLOWSHIP

(Contact: Adriana Reza, AReza@lbl.gov)

The ALS offers two types of research fellowships: the Doctoral Fellowship in Residence and the newly instituted Postdoctoral Fellowship.

ALS Doctoral Fellowship in Residence. These fellowships enable students who have passed their Ph.D. qualifying or comprehensive verbal and written exams to acquire hands-on scientific training and develop professional maturity for independent research. Applicants must be full-time, currently enrolled students in a Ph.D. program in the physical or biological sciences pursuing thesis research based on the use of synchrotron radiation. The fellowships are offered as one-year appointments with the possibility of renewal. Successful applicants will be compensated with an \$18,000 annual stipend. Additionally, fellows will be matched with an on-site mentor and have access to ALS resources, including beam time. Fellows are expected to present their results at a meeting or as a seminar at the end of the fellowship year. Applications for the 2007-2008 academic year are due by June 30, 2007. For more information, go to the ALS Doctoral Fellowships Web page, <http://www-als.lbl.gov/als/fellowships/index.html>.

ALS Postdoctoral Fellowship. The purpose of this new ALS fellowship program is to identify outstanding individuals in new and emerging scientific and engineering research fields and provide advanced training in synchrotron radiation science. Fellows become integral members of ALS research teams. Applicants must have received a doctoral research degree from an accredited academic institution in an appropriate scientific or engineering discipline within three years of the appointment start date. Applications are reviewed on a quarterly basis. Awards are initially for one year with the possibility of renewal for a second or third year, contingent on satisfactory annual performance reviews and funding availability. Salary is competitive with current ALS/Berkeley Lab postdoctoral fellows, ranging from \$60,000 to \$66,000 per year, depending on the number of years since receipt of the doctoral degree. Postdoctoral fellows are also eligible for midlevel career benefits. For more information on the fellowship and application requirements, go to the ALS Postdoctoral Fellowships Web page at <http://www-als.lbl.gov/als/fellowships/postdoc.html>

10. ALS-RELATED WEB NEWS AND LINKS

Carbon joins the magnetic club

<http://www.physorg.com/news98111007.html>

'Racetrack' memory could gallop past the hard disk

<http://www.newscientisttech.com/channel/tech/dn11837-racetrack-memory-could-gallop-past-the-hard-disk.html>

Model of cancer-preventing enzyme studied

http://news.monstersandcritics.com/health/news/article_1303417.php/Model_of_cancer-preventing_enzyme_studied

A magnetic hippodrome

http://www.economist.com/science/displaystory.cfm?story_id=9143982

Moving walls with current

<http://focus.aps.org/story/v19/st14>

A crystal with a story to tell

<http://pubs.acs.org/cen/news/85/i17/8517notw1.html>

Hotel on a hill: 60 rooms, suites for lab's 'guest house' plans

<http://www.berkeleydaily.org/text/article.cfm?issue=05-18-07&storyID=27076>

11. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs scheduled between April 24 and May 13, the beam reliability (time delivered/time scheduled) was 93.9%%. Of the scheduled beam, 84.5% was delivered to completion. There were no significant interruptions.

Long-term and weekly operations schedules are available on the Web at <http://www-als.lbl.gov/als/schedules/index.html> . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at <http://www-als.lbl.gov/als/status/> .

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ALSNews is a monthly electronic newsletter to keep users informed about developments at the Advanced Light Source, a national user facility located at Ernest Orlando Lawrence Berkeley National Laboratory, University of California. The current and past issues of ALSNews are available on the World Wide Web. Point your browser to the following URL:

http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

LBNL/PUB-948 (2007)

Editors: jmccullough@lbl.gov, lstamura@lbl.gov, ejmoxon@lbl.gov

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Current issue online at http://www-als.lbl.gov/als/als_news/

1. FIRST DIRECT EVIDENCE OF DIRAC FERMIONS IN GRAPHITE

(Contact: Alessandra Lanzara, ALanzara@lbl.gov)

The recent surge of interest in the electronic properties of graphene--that is, isolated layers of graphite just one atomic layer thick--has largely been driven by the discovery that electron mobility in graphene is ten times higher than in commercial-grade silicon, raising the possibility of high-efficiency, low-power, carbon-based electronics. Scientists attribute graphene's surprising current capacity (as well as a number of even stranger phenomena) to the presence of charge carriers that behave as if they are massless, "relativistic" quasiparticles called Dirac fermions. Harnessing these quasiparticles in real-world carbon-based devices, however, requires a deeper knowledge of their behavior under less-than-ideal circumstances, such as around defects, at edges, or in three dimensions--in other words, in graphite. At the ALS, a team of researchers using angle-resolved photoemission spectroscopy (ARPES) has now produced the first direct evidence of massless Dirac fermions in graphite coexisting with quasiparticles of finite effective mass and defect-induced localized states.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/144dirac_fermions.html

Publication about this research: S.Y. Zhou, G.-H. Gweon, J. Graf, A.V. Federov, C.D. Spataru, R.D. Diehl, Y. Kopelevich, D.-H. Lee, S.G. Louie, and A. Lanzara, "First direct observation of Dirac fermions in graphite," *Nature Physics* 2, 595 (2006).

2. STRUCTURE OF THE COMPLETE 70S RIBOSOME AT 3.7 ANGSTROM RESOLUTION (Contact: Harry Noller, harry@nuvolari.ucsc.edu)

Ribosomes are RNA-based protein factories found in all living cells, responsible for translating the genetic information encoded in messenger RNA (mRNA) into proteins. The first x-ray structures of the complete 70S ribosome were determined in 1999 at 7.8 angstroms and in 2001 at 5.5 angstroms, using diffraction data collected at ALS Beamline 5.0.2. These structures showed how the ribosomal RNA and the more than 50 ribosomal proteins are organized to form the structure of the complete ribosome and the positions of the mRNA and transfer RNAs (tRNAs) in the ribosome. Now, using data collected at ALS Beamline 12.3.1, researchers from the University of California, Santa Cruz, have solved the structure of a *Thermus thermophilus* 70S ribosome functional complex at 3.7 angstroms resolution. Because of the large cell dimensions of ribosome crystals, they diffract weakly, and spots are crowded close together in the diffraction patterns. Consequently, the high-flux beams, sensitive large-area detectors, and well-focused, compact beam cross sections available at the ALS all played a crucial role in this work. Research in this area may lead to novel antibiotics targeting bacterial ribosomes that have developed resistance to current drugs.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/143ribosome.html

Publication about this research: A. Korostelev, S. Trakhanov, M. Laurberg, and H. Noller, "Crystal structure of a 70S ribosome-tRNA complex reveals functional interactions and rearrangements," *Cell* 126, 1065 (2006).

3. SAXS/WAXS BEAMLINE LOOKS UP CLOSE AND FAR AWAY (Contacts: Alexander Hexemer, AHexemer@lbl.gov, and Howard Padmore, HAPadmore@lbl.gov)

Beamline 7.3.3 has been transformed from an x-ray microdiffraction facility into a simultaneous small-angle and wide-angle x-ray scattering (SAXS/WAXS) beamline, the only one of its kind at the ALS. The q-range for the SAXS/WAXS setup is from 0.004 angstroms⁻¹ to 8.7 angstroms⁻¹. The x-ray energy in regular operation mode is fixed at 10 keV and yields an x-ray flux of 1.7×10^{12} photons/s at the sample position. The beamline can accommodate a wide variety of samples, stages, and environments. This dual-detector endstation allows researchers to nondestructively examine proteins, protein complexes, and other large molecules in solution. These molecules can exist in a variety of states, and SAXS can follow the changes in shape from one state to another, impossible with traditional crystallography. The beamline can also accommodate research on polymer systems and liquid crystals, including determining nanophase structure and subtle structural changes, detectable as a function of temperature. As the SAXS/WAXS detectors probe the samples, they work in concert with other measuring devices. For example, a tensile stage stretches polymer materials, and multiple images report the changes in the structure. The beamline also provides a differential scanning calorimeter (DSC) stage for

users, which can change sample temperature from about -200 to +600 degrees C, allowing precise monitoring of the morphology of the sample by taking images close to phase transitions.

The SAXS section of the beamline achieved first light last February, and WAXS achieved first light this month. The beamline's first experiment, in collaboration with Robert Birgeneau, UC Berkeley Chancellor and Professor of Physics, is already yielding results. The sample was a thermotropic liquid crystal that changed phases from isotropic to nematic to smectic as a function of temperature. The SAXS data were taken in situ while the sample was cooled from 80 to 45 degrees C. In addition to proteins and polymer systems, a third SAXS/WAXS research focus will be earth sciences, which, for example, will be concerned with the shape and growth process of nanoparticles in solution.

4. PETER DENES JOINS ALS AS ENGINEERING DEPUTY

Peter Denes, Berkeley Lab Engineering Division Deputy, is in the process of making the move over to the ALS as our Deputy for Engineering. "Peter has been a leader within Engineering and in detector development at the Lab, and we're now looking forward to his playing a larger role in these efforts for the ALS," said Roger Falcone, ALS Division Director.

In the Engineering Division, Denes was responsible for electronics, software, and instrumentation engineering and brings this expertise to his new position. Peter's dedicated and on-site presence will provide tighter coupling between the Engineering Division and the ALS, more integrated management of engineering resources within the ALS, and a long-range focus as the ALS looks to its future as well as to the next generation light source. A primary component of his job will be the ALS Detector Program. "This program is a virtual umbrella that brings together talent from the ALS, Engineering, and Physics to focus on the detector needs of the ALS," stated Peter. "Detectors can be purchased from manufacturers, but the unique requirements of the ALS beamlines often require unique detectors which are not available commercially." This new program aims to help users with existing detectors as well as to develop novel detectors that will improve ALS science. As the detector program gets off the ground, Peter also anticipates incorporating a postdoc program where new engineers can be mentored and trained. This detector program anticipates the Department of Energy's Office of Basic Energy Sciences (BES) detector and accelerator R&D initiative that is slated for FY 2008 and will enhance Berkeley Lab's ability to do research in this area.

Look for the detector workshop at the ALS Users' Meeting in October--"New Opportunities for Science with Advanced Detectors"--where Peter and Howard Padmore will provide an overview of the new program and user input will be sought on improvements and developments.

5. THE ALS EXPERIENCES ANOTHER SAFE AND SUCCESSFUL SHUTDOWN (Contact: Steve Rossi, SLRossi@lbl.gov)

Thanks to our dedicated and hard-working staff, we have another safe and successful shutdown behind us (the ALS resumed operation on June 20). Accelerator and beamline work

accomplished during that time included front-end modifications at Beamline 4.0 to accommodate the new MERLIN beamline, installation of errant-photon-beam interlock features in Sector 4, a swap-out of the ailing superbend magnet in Sector 4, a full survey and alignment of the storage ring, continued commissioning of our new booster power supply system, and a myriad of other work. While our staff worked on technical projects, we also had major construction going on in the building. We accomplished phase one of a four-year effort to seismically retrofit the historic ALS dome. Coordination of this work with our own shutdown efforts proved challenging as it restricted access and was very noisy.

The shutdown was also scheduled to coincide with the demolition of Building 10 because of vibration concerns from the heavy work. The contractor quickly demolished the WWII-era building once the abatement of hazardous materials was completed. The site will remain a dirt pad until the beginning of construction on the User Support Building, scheduled for March 2008. Berkeley Lab has finalized a contract with Overaa Construction to complete the design work and construct this new user facility, and occupancy is anticipated for fall 2009.

View additional images of the Spring 2007 Shutdown at <http://www-als.lbl.gov/als/project/>

6. ALS USER BYRON FREELON FIRST RECIPIENT OF THE MOREHOUSE PRIZE

Byron Freelon has been awarded the first Morehouse Prize by the National Society of Black Physicists (NSBP), which recognizes graduates of historically black colleges and universities who have shown considerable promise as physics researchers and teachers. The prize, awarded for his work in x-ray Raman scattering on artificial superconducting materials, and his strong support of NSBP student programs, includes a cash award and a travel grant to give a colloquium at Morehouse College. Freelon accepted the award at Morehouse College on April 5 and gave a talk entitled "Probing High-Temperature Superconductors with Layers and Light." Freelon attended Prairie View A&M University and received a Ph.D. in physics from the University of Minnesota in 2001. As a Berkeley Lab postdoc, he performed studies on high-temperature superconductors and developed a molecular beam epitaxy chamber at ALS Beamline 7.0.1. He is currently a research scientist in the UC Berkeley group led by Chancellor Robert Birgeneau exploring the behavior of high-temperature superconductors and liquid crystal systems using x-ray scattering. The Morehouse Physics Prize was established through a financial gift by Dr. and Mrs. Walter Massey. Dr. Massey is the current President of Morehouse College and a former Director of the National Science Foundation.

7. THE ALS COMMUNICATIONS GROUP GETS THE WORD OUT

(Contact: alscommunications@lbl.gov)

For the last several months, ALSNews has been featuring user support groups, putting the names to the faces, and giving you an idea of what they do and who to call when you need assistance. Now we turn the spotlight on ourselves, the Communications Group. Our jobs are challenging and fun. We communicate about the science, people, and events of the ALS user community to scientists of all disciplines, students, teachers, the local community, Berkeley Lab staff, members

of Congress, Department of Energy program managers, and people who just love science. So if you have recently published in a high-profile journal, need a cover, have a newsworthy item for ALSNews, lightsources.org, or a Lab press release, contact us at alscommunications@lbl.gov.

Read the full story at

http://www-als.lbl.gov/alsdev/als_news/news_archive/vol.277_062707.html#7

8. 2007 ALS USERS' MEETING

(Contact: alsum@lbl.gov)

General information, meeting deadlines, online registration, and accommodations information for this year's ALS Users' Meeting, to be held at Berkeley Lab October 4-6, will be posted shortly. The early registration deadline is Friday, September 15.

ABSTRACT SUBMISSION. The deadline for abstract submissions for oral presentations during the ALS Scientific Highlights session is Tuesday, August 15. The online submission Web page will be posted shortly.

WORKSHOPS. This year, 12 workshops, including several joint ALS-Molecular Foundry workshops (indicated with an *), will follow the end of the formal Users' Meeting program, beginning Friday afternoon (October 5) and continuing through Saturday (October 6). Workshop topics and respective organizers are as follows:

Ambient Pressure Photoelectron Spectroscopy (Hendrik Bluhm, Simon Mun, and Miquel Salmeron)

Advanced X-Ray Optics Metrology for Nanofocusing and Coherence Preservation (Valeriy Yashchuk and Kenneth Goldberg)

Atmospheric Aerosols (Mary Gilles)

Beyond Top-Off: Opportunities for Improved ALS Performance (David Robin and Christoph Steier)

Design and Function of Protein Nanostructures* (Ronald Zuckermann and PetrusZwart)

Nanomagnetism* (Peter Fischer, Jeffrey Neaton, Holger Schmidt, and Tolek Tyliszczak)

New Infrared Science Opportunities at the ALS (Michael Martin, Peter Nico, and Fernando Sannibale)

New Opportunities for Science with Advanced Detectors (Peter Denes and Howard Padmore)
Photon-In/Photon-Out Inelastic X-Ray Scattering in Renewable Energy Science (Jinghua Guo and Franz Himpsel)

Polymer Science* (Harald Ade, Alexander Hexemer, and Bumjoon Kim)

Soft and Hard X-Ray Tomography (Gerry McDermott, Alastair MacDowell, and Dula Parkinson)

Theory at the ALS (Arun Bansil, Dung Hai Lee, and Zahid Hussain)

9. JULY 15 DEADLINE FOR GENERAL USER PROPOSAL SUBMISSIONS

(Contact: alsproposals@lbl.gov)

The User Services Office is accepting general user proposals from scientists who wish to conduct research in the general sciences at the ALS during the running period from January through June 2008. The deadline is July 15, 2007. (This deadline does not apply to protein crystallography proposals, which have a separate process and schedule.) To submit a new proposal, go to http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/Page1P.shtml/Initialize . For further information on proposals, go to <http://www-als.lbl.gov/als/quickguide/independinvest.html>

10. GENERAL USER PROPOSAL SCORES POSTED ONLINE

(Contact: Janos Kirz, JKirz@lbl.gov)

The general user beam time allocation process for the running period from July through December 2007 is complete for the general sciences. The number of eight-hour shifts requested was 5389, of which 3130 shifts (58%) were allocated. For more detailed results, including beamline score distributions and cutoff scores, go to <http://www-als.lbl.gov/als/quickguide/pspscores.html> . Beam-time requests for general user experiments are reviewed twice each year. A Proposal Study Panel (PSP) evaluates each proposal, providing the basis for granting beam time. The PSP is made up of ten scientists from a variety of synchrotron scientific disciplines. There is a separate PSP that reviews the crystallography proposals six times each year. More information on the PSP and the general user proposal review process is available at <http://www-als.lbl.gov/als/quickguide/independinvest.html> .

11. USER SERVICES GROUP LEADER SOUGHT

(Contact: <http://jobs.lbl.gov>)

The ALS is looking for a User Services Group Leader. This individual is responsible for user services, experiment setup coordination, and communications. As a Group Leader, this person will be a member of the Strategic Management Team (which directs the strategic scientific course of the ALS) and helps determine the ALS long-range running schedule. Because commitment to safe and reliable operation at the facility is critical, the incumbent will assist in formulating and implementing key ALS user safety policies. To be successful, the Group Leader will have a Ph.D. degree or equivalent in the physical or biosciences with extensive experience in applications of synchrotron radiation science. This person must also have substantial leadership experience in planning, development, and management of a scientific user program. Job details and application instructions are at <http://jobs.lbl.gov> . Click "Search" and enter 20716 in the search field.

12. ALS-RELATED WEB NEWS AND LINKS

Bay Area partnership to host DOE Bioscience Center

<http://www.lbl.gov/Science-Articles/Archive/JBEI-announcement.html>

Future light: A look ahead with Roger Falcone

<http://www.lbl.gov/Publications/Currents/Archive/#9>

X-ray transparency

<http://www.aip.org/pnu/2007/split/827-2.html>

Demolition makes way for new ALS building

<http://www.lbl.gov/today/2007/Jun/18-Mon/6-18-07.html>

In nature, proteins sweep up nanoparticles

<http://www.physorg.com/news101120324.html>

House Appropriations Committee backs full FY 2008 DOE science request

<http://www.aip.org/fyi/2007/060.html>

13. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

The ALS shut down on Monday, May 14, 2007, for planned installations and maintenance. User operations resumed on June 20, 2007. For the user runs scheduled between June 20 and June 25, the beam reliability (time delivered/time scheduled) was 88.7%. Of the scheduled beam, 88.7% was delivered to completion. Scheduled interruptions for the completion of Building 10 deconstruction were observed. All lost time resulted from problems with the injection system (mostly inefficient injection).

Long-term and weekly operations schedules are available on the Web at <http://www-als.lbl.gov/als/schedules/index.html> . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at <http://www-als.lbl.gov/als/status/> .

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ALSNews is a monthly electronic newsletter to keep users informed about developments at the Advanced Light Source, a national user facility located at Ernest Orlando Lawrence Berkeley National Laboratory, University of California. The current and past issues of ALSNews are available on the World Wide Web. Point your browser to the following URL:

http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

LBNL/PUB-948 (2007)

Editors: jmccullough@lbl.gov, lstamura@lbl.gov, ejmoxon@lbl.gov

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Current issue online at http://www-als.lbl.gov/als/als_news/

1. FIRST PROOF OF FERROMAGNETIC CARBON

(Contact: Hendrik Ohldag, hohldag@stanford.edu)

Although it has long been suspected that carbon belongs on the short list of materials that can be magnetic at room temperature, attempts to prove that pure carbon can be magnetized have remained unconvincing. However, using a proton beam and an advanced x-ray microscope at the Advanced Light Source, a multinational team of researchers from the Stanford Synchrotron Radiation Laboratory, the University of Leipzig, and the ALS finally put to rest doubts about the existence of magnetic carbon.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/147carbon.html

Publication about this research: H. Ohldag, T. Tyliczszak, R. Hoehne, D. Spemann, P. Esquinazi, M. Ungureanu, and T. Butz, " π -electron ferromagnetism in metal-free carbon probed by soft x-ray dichroism," Phys. Rev. Lett. 98, 187204 (2007).

2. SYMMETRY BREAKING OF H₂ DISSOCIATION BY A SINGLE PHOTON

(Contact: Thorsten Weber, TWeber@lbl.gov)

A single hydrogen (or deuterium) molecule consists of only two protons (deuterons) and two electrons and is perfectly symmetric. Linearly polarized photons are similarly symmetric. So one might think that the angular distribution of photoelectrons resulting from photoionization of the molecule by the photon accompanied by dissociation into a hydrogen atom and a hydrogen ion would itself be symmetric. However, an international team of researchers from Germany, Spain, and the U.S. has now shown that this need not be the case. When there are multiple quantum paths for the process, interference between waves in the coherent superposition of electron states

(which exists when the molecular fragments are still close together) skews the distribution by breaking the molecular symmetry.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/150symmetry-break.html

Publication about this research: F. Martin, J. Fernandez, T. Havermeier, L. Foucar, Th. Weber, K. Kreidi, M. Schoeffler, L. Schmidt, T. Jahnke, O. Jagutzki, A. Czasch, E.P. Benis, T. Osipov, A.L. Landers, A. Belkacem, M.H. Prior, H. Schmidt-Boecking, C.L. Cocke, and R. Doerner, "Single photon-induced symmetry breaking of H₂ dissociation," *Science* 315, 629 (2007).

3. STRUCTURE AND RECEPTOR SPECIFICITY OF AN AVIAN FLU ANTIGEN

(Contacts: Ian Wilson, wilson@scripps.edu; James Stevens, jstevens@scripps.edu)

To date, the H5N1 avian influenza viruses, which are currently circulating in domestic and wild birds on three continents, have only a limited ability to infect humans. However, with continued outbreaks of the virus in poultry and wild birds, the potential for the emergence of a human-adapted H5 virus, either by reassortment (the mixing of genetic material from similar viruses) or mutation, is seen as a major threat to public health worldwide. Of the three influenza pandemics of the last century, the 1957 (H2N2) and 1968 (H3N2) pandemics involved avian-human reassortments. The origin of the 1918 influenza virus (H1N1), which killed about 50 million people worldwide, is unknown. Although a number of viral factors can determine the host range restriction and pathogenicity of influenza A viruses, recent evidence suggests that hemagglutinin (HA), the principal antigen on the viral surface, is a critical factor for efficient human-to-human transmission. Researchers have now solved the HA structure to 2.9 angstroms at the ALS and analyzed its specificity to human receptors.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/148avianflu.html

Publication about this research: J. Stevens, O. Blixt, T.M. Tumpey, J.K. Taubenberger, J.C. Paulson, and I.A. Wilson, "Structure and receptor specificity of the hemagglutinin from an H5N1 influenza virus," *Science* 312, 404 (2006).

4. MATERIAL MANAGEMENT GROUP KEEPS THE ALS ON TRACK

(Contact: Gary Giangrosso, GJGiangrosso@lbl.gov)

Need to ship something, store something, move something, set something up? The Material Management group will do it. Gary Giangrosso (section manager), Todd Anderson, Derrick Crofoot, and Jason De Ponte are located in the warehouse adjacent to the ALS (Building 7). The group wears two "hats"--it is responsible for both material and property management for the ALS Division. In its material management capacity, the group provides shipping, receiving, gas-bottle ordering, refilling and servicing of liquid nitrogen dewars, temporary storage, endstation setup services, and movement/assembly of office and lab equipment. Giangrosso and his team maintain

a stockroom of parts and equipment in the warehouse (including safety devices) commonly needed by ALS users and technicians. Stockroom supplies are accessible by key card 24 hours a day. Another service provided is the generation of purchase requisitions for ALS staff and users requesting new supplies and equipment. Also, a new barcode system has been implemented for tracking chemicals that arrive at the ALS on a daily basis.

In its property management capacity, the group handles property issues and questions about custodian and location changes for DOE assets out of the property management office (Bldg. 7, Rm. 102). They also generate property passes for laptop computers and equipment that will be taken off site for business travel or home use.

5. 2007 ALS USERS' MEETING APPROACHES

(Contacts: alsum@lbl.gov; Peter Fischer, PJFischer@lbl.gov; and Ken Goldberg, KAGoldberg@lbl.gov)

The ALS Users' Meeting will be held on site at Berkeley Lab--from Thursday, October 4, to Saturday, October 6--and will offer a variety of invited talks, workshops, and selected science highlights. For the first time, this year's meeting will feature a joint plenary session with the Molecular Foundry Users' Meeting, which is taking place simultaneously at Berkeley Lab. In addition, we will hold a joint poster session and dinner to bring the two user communities together around their research. More information on the Users' Meeting is available on the Users' Meeting Web site at <http://www.als.lbl.gov/als/usermtg/>. Furthermore, there will be twelve workshops this year, three to be held in conjunction with the Foundry. See <http://www-als.lbl.gov/als/usermtg/workshops.html> for more information. The workshops' abstract deadline is now upon us; workshop organizers requiring additional information should contact alsum@lbl.gov or the meeting chairs, Peter Fischer (PJFischer@lbl.gov) and Ken Goldberg (KAGoldberg@lbl.gov).

6. ALS-RELATED WEB NEWS AND LINKS

Engineers go history-free

<http://www.americanmachinist.com/304/Issue/Article/False/68560/Issue>

Breakthrough with ultra-fast x rays

<http://www.physorg.com/news102683602.html>

Chemically selective soft x-ray patterning of polymers

<http://www.lightsources.org/cms/?pid=1002245>

7. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs scheduled between June 26 and July 22, the beam reliability (time delivered/time scheduled) was 90.6%. Of the scheduled beam, 83.7% was delivered to completion. There were no significant interruptions.

Long-term and weekly operations schedules are available on the Web at <http://www-als.lbl.gov/als/schedules/index.html> . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at <http://www-als.lbl.gov/als/status/> .

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http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

LBNL/PUB-948 (2007)

Editors: jmccullough@lbl.gov, lstamura@lbl.gov, ejmoxon@lbl.gov

This work was supported by the Director, Office of Science, Office of Basic Energy Sciences, of the U.S. Department of Energy under Contract No. DE-AC02-05CH11231.

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Current issue online at http://www-als.lbl.gov/als/als_news/

1. UNIQUE AUXIN REGULATING MECHANISM DISCOVERED

(Contact: Ning Zheng, NZheng@u.washington.edu)

The plant hormone auxin regulates many plant growth and development processes, including shoot growth, root branching, fruit ripening, tropisms, and flowering. But how such a simple molecule elicits such a variety of cellular responses has been a mystery. An important breakthrough came in 2005, when a conserved plant protein known as TIR1 (part of a protein destruction machinery system) was identified as a receptor for auxin. Now, an international group of scientists, using data collected at ALS Beamlines 5.0.2, 8.2.1, and 8.2.2, has taken a further step in unraveling the auxin mystery through a series of protein crystallographic studies that elucidate the atomic details of how auxin is sensed by and in turn activates its receptor. Their results reveal a surprising role for the plant hormone as a "molecular glue" that brings two proteins together to accelerate protein destruction. Because this protein degradation system is conserved from plants to humans, these results can be used in drug development for the treatment of human diseases such as cancer.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/149auxin.html

Publication about this research: X. Tan, L.I.A. Calderon-Villalobos, M. Sharon, C. Zheng, C.V. Robinson, M. Estelle, and N. Zheng, "Mechanism of auxin perception by the TIR1 ubiquitin ligase," *Nature* 446, 640 (2007).

2. UNEXPECTED ANGULAR DEPENDENCE OF X-RAY MAGNETIC LINEAR DICHROISM

(Contact: Elke Arenholz, EArenholz@lbl.gov)

Using spectroscopic information for magnetometry and magnetic microscopy obviously requires detailed theoretical understanding of spectral shape and magnitude of dichroism signals. A research team at ALS Beamline 4.0.2 has now shown unambiguously that, contrary to common belief, spectral shape and magnitude of x-ray magnetic linear dichroism (XMLD) are not only determined by the relative orientation of magnetic moments and x-ray polarization, but their orientation relative to the crystallographic axes must be taken into account for accurate interpretation of XMLD data.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/151XMLD.html

Publication about this research: E. Arenholz, G. van der Laan, R.V. Chopdekar, and Y. Suzuki, "Angle-dependent Ni^{2+} x-ray magnetic linear dichroism: Interfacial coupling revisited," Phys. Rev. Lett. 98, 197201 (2007).

3. STORAGE RING Rf KLYSTRON UPGRADE

(Contacts: Ken Baptiste, KMBaptiste@lbl.gov; David Robin, DSRobin@lbl.gov)

The ALS is upgrading the storage ring rf klystron, which has performed well beyond its expected lifetime. Although the ALS has an identical spare, we don't know how long it will last, the technology is becoming obsolete, and there are only one or two suppliers for this class of klystron. The replacement solution is a system of four combined inductive output tube (IOT) amplifiers. This commercially available power source will support ALS operations for the next 15 to 20 years, and its higher operating efficiency should translate into reduced energy consumption and operating cost for the same output power level.

The transmission line network for our existing two rf cavities will be modified to receive power from the combined IOT amplifiers and to add operational flexibility by providing independent phase and amplitude control of each cavity. In order to support the IOT-based amplifiers, we will upgrade the existing high-voltage power supply by replacing its final step-up/rectifier transformer. The upgrade will have lower voltage and higher current capabilities, thus will maintain existing AC input power infrastructure. We will also replace the analog rf controls with a digitally based system. These digital rf controls will provide independent phase and amplitude control of each independent cavity with greater accuracy, and dynamic range and key parameters will be programmable, providing a better feature set to meet future goals.

The upgrading process, which is being funded by the Basic Energy Sciences Division of the U.S. Department of Energy, will occur over the next three years.

4. ALS HOSTS HIGH SCHOOL INTERNS

(Contact: Center for Science and Engineering Education, csee@lbl.gov)

Berkeley Lab's High School Student Research Participation Program provides talented high school students with paid summer internships in science, engineering, technology, computing sciences, and related areas. This year, over 300 students applied and 30 were selected. They came not only from the San Francisco Bay Area, but from as far away as Hawaii and Pennsylvania. The students participated 40 hours a week for six weeks from June 27 through August 10. The ALS was fortunate enough to host two of these interns, Sam Bozek and John Stevick.

Sam Bozek, an Albany High School senior (as of this fall), worked on Beamline 10.0.1. His mentor, beamline scientist Alex Aguilar, took advantage of Sam's strengths in mathematics and put him to work on recalibrating the undulator. Using data he helped obtain from the beamline as well as sets of archival data, Sam performed analyses with IGOR Pro software. "The results of Sam's work will allow us to implement a new method of controlling the undulator gap that will correct for the disadvantages of the present method," said Alex. Sam's stint at the ALS has renewed his interests in math and physics. "Working at the ALS is so different from the classroom. But that's a good thing," admits Sam. "School can be dry, and finding out that I can apply what I've learned is very invigorating."

John Stevick will be a senior this fall at Berkeley High School. He was mentored by Byron Freelon and worked as part of a joint ALS/Engineering team at Beamline 7.0.1 that is designing a substrate heater for pulsed laser deposition (PLD) thin-film growth. John worked on the design and construction of the heater's temperature control box, a crucial part of the project as thin-film growth requires stable temperatures in order to control film surface chemistry. John is founder and president of the Berkeley High Engineering Club. This background stood him in good stead on his summer internship project.

An abstract book of the students' projects and more information about the High School Student Research Participation Program are available from the Center for Science and Engineering Education, <http://csee.lbl.gov/>, 510-486-5511.

5. USERS' MEETING: REGISTRATION AND CALL FOR ABSTRACTS

(Contacts: alsum@lbl.gov; Peter Fischer, PJFischer@lbl.gov; and Ken Goldberg, KAGoldberg@lbl.gov)

Register now for the ALS Users' Meeting to be held October 4-6, 2007, at Berkeley Lab. This year, the ALS will be holding joint events with the Molecular Foundry's User Meeting, including plenary and poster sessions, student poster competition, exhibits of synchrotron-related equipment, and social events. See the updated meeting agenda for details. Between 500 and 600 attendees are expected for the two meetings. In addition, 12 focused workshops, several of which are jointly organized with the Molecular Foundry, will be held on Friday afternoon (October 5) and/or Saturday (October 6).

Online Abstract Submission

ALS users and staff are invited to submit abstracts for inclusion in the poster session and student poster competition. The poster sessions will be held at the conclusion of the plenary session on the first day (October 4) and will be followed by the awards banquet on the ALS patio. Brief abstracts may be submitted online on the Abstracts Web page.

Important Meeting Deadlines

- Abstract Submissions: September 10
- Award Nominations: September 24
- Early Registration: September 15
- Exhibitor Registration: September 10
- Hotel Reservations: September 8

Go to the ALS Users' Meeting Web site for additional details regarding the meeting program, accommodations, and online abstract submission and registration information:

<http://www-als.lbl.gov/als/usermtg/index.html>

6. COHERENCE 2007 WORKSHOP DRAWS RECORD ATTENDANCE

(Contact: Janos Kirz, JKirz@lbl.gov)

Interest in coherent x-ray science is increasing rapidly, both in the areas of diffraction microscopy and x-ray photon correlation spectroscopy. The first workshop devoted to these topics was held in Berkeley in 2001. This was followed by gatherings in Cairns, Australia (2003), and Porquerolles, France (2005). The most recent workshop took place at the Asilomar Conference Center near Monterey on June 25-28, 2007. It was attended by 150 practitioners (50 more than anticipated) from all parts of the world. In addition to more than 30 talks, 70 posters were presented, showcasing progress on both the experimental and theoretical fronts. In addition to ongoing work and plans for new beamlines at third-generation light sources, new results from FLASH (the x-ray free-electron laser [FEL] in Hamburg) and from laboratory-scale x-ray lasers were discussed, as well as plans for experiments at x-ray FELs under construction on three continents.

The workshop was sponsored by the ALS, the Center for X-Ray Optics, Lawrence Livermore National Laboratory, and the Center for Biophotonics at the University of California, Davis. The poster sessions and banquet were further enlivened by refreshments generously contributed by XRADIA. The program and abstracts can be found on the conference web site:

<http://www-als.lbl.gov/coherence2007/>

7. SUBMIT YOUR ALS PUBLICATIONS, INVITED TALKS, AND AWARDS BY WEDNESDAY, SEPTEMBER 12

(Contact: Ken Winters, ALSPubs@lbl.gov)

We have begun preparation for the DOE BES triennial review, scheduled for early 2008, and we need a complete list of ALS published information. We have developed new features in our database that will allow you to more easily submit your data. However, you are now required to log in. Please visit the ALS Publication Verification Login page at the URL below, and if you have not logged in to our system before, click on the link that says "Request ALS Password," and one will be sent to you.

http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/PubVerifyPass.shtml/Initialize

In addition to your publications (scientific journals, conference proceedings, book chapters, completed Ph.D. theses, and patents), invited talks and awards based on research conducted at the ALS should also be entered into the ALS database. Before entering your data, please search the database. Often a colleague has already entered the information, and you can avoid duplicating the effort. Your timely response will be greatly appreciated, as it is imperative that we accurately track the publications we generate. Remember, if it's on your CV and all or part of the work was done at the ALS, it should be in our database!

8. ALS-RELATED WEB NEWS AND LINKS

Getting a better handle on antidepressant action
<http://www.lightsources.org/cms/?pid=1002319>

Cheerful news for antidepressant research
<http://www.rsc.org/chemistryworld/News/2007/August/09080702.asp>

Researchers rely on Newton's interference for new experiment
<http://www.lightsources.org/cgi-bin/psearch/search.pl?q=dusty%20mirror&showurl=http%3A//www.lightsources.org/cms/%3Fpid%3D1002294>

Return to Wild 2
<http://www.lbl.gov/Science-Articles/Archive/sabl/2007/Jul/wildOrganics.html>

9. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs scheduled between July 24 and August 27, the beam reliability (time delivered/time scheduled) was 93.6%. Of the scheduled beam, 89.2% was delivered to completion. There were no significant interruptions.

Long-term and weekly operations schedules are available on the Web at <http://www-als.lbl.gov/als/schedules/index.html> . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at <http://www-als.lbl.gov/als/status/> .

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LBNL/PUB-948 (2007)

Editors: jmccullough@lbl.gov, lstamura@lbl.gov, ejmoxon@lbl.gov

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Current issue online at http://www-als.lbl.gov/als/als_news/

1. X-RAY IMAGING CURRENT-DRIVEN MAGNETIC DOMAIN-WALL MOTION IN NANOWIRES

(Contact: Peter Fischer, pjfischer@lbl.gov)

The quest to increase both computer data-storage density and the speed at which one can read and write the information remains unconsummated. One novel concept is based on the use of a local electric current to push magnetic domain walls along a thin nanowire. A German, Korean, Berkeley Lab team has used the x-ray microscope XM-1 at the ALS to demonstrate that magnetic domain walls in curved permalloy nanowires can be moved at high speed by injecting nanosecond pulses of spin-polarized currents into the wires, but the motion is largely stochastic. This result will have an impact on the current development of magnetic storage devices in which data is moved electronically rather than mechanically as in computer disk drives.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/153domainwall.html

Publication about this research: G. Meier, M. Bolte, R. Eiselt, B. Krueger, D.-H. Kim, and P. Fischer, "Direct imaging of stochastic domain-wall motion driven by nanosecond current pulses," Phys. Rev. Lett. 98, 187202 (2007).

2. EXTRACELLULAR PROTEINS PROMOTE ZINC SULFIDE AGGREGATION

(Contact: John Moreau, jwmoreau@usgs.gov)

Researchers from the ALS, Berkeley Lab's National Center for Electron Microscopy (NCEM), and Lawrence Livermore National Laboratory analyzed biofilm samples rich in zinc sulfide and dominated by sulfate-reducing bacteria, which were collected from lead-zinc mine waters. The researchers were curious about the relationship of the organic material and metals, particularly how organics affect mobility, and its potential for bioremediation. It is known that some organics promote aggregation. Amine-bearing molecules, for example, can organize sulfide nanoparticles

into semiconductor nanowires. The research team used a series of imaging techniques and detectors to analyze aggregates of biogenic zinc sulfide nanocrystals in the biofilms. Their examination yielded excellent results and some surprises. They were able to prove that natural organic matter promotes dense aggregation of the zinc sulfide nanocrystals into much larger spheroids and that the organic matter is preserved in nanometer-scale pores in the spheroids. What was not expected was the presence of proteins in the spheroids, making them a key component in aggregation and an example of extracellular biomineralization.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/152biominerals.html

Publication about this research: J.W. Moreau, P.K. Weber, M.C. Martin, B. Gilbert, I.D. Hutcheon, and J.F. Banfield, "Extracellular proteins limit the dispersal of biogenic nanoparticles," *Science* 316, 1600 (2007).

3. UPGRADES TO BEAMLINES 8.2.1 AND 8.2.2

(Contact: Paul Adams, pdadams@lbl.gov)

The ALS is midway through a two-year upgrade to Beamlines 8.2.1 and 8.2.2, the two superbend macromolecular crystallography beamlines operated by the Berkeley Center for Structural Biology (BCSB). The improvements are designed to allow screening of, and data collection from, small crystals and will help resolve structures of large complexes.

Two major parts of the upgrade have been completed. In December 2006, an upgraded large-format CCD detector was installed on Beamline 8.2.1 to facilitate high-resolution data collection and the study of crystals with large unit cells. After extensive offline testing, a Rigaku ACTOR robot was installed in the endstation hutch at Beamline 8.2.2 during the recent shutdown. It is compatible with other automounters at the ALS and has a Java control system that has been integrated into the BCSB BOS beamline control software. An identical robot will be installed at Beamline 8.2.1 and is presently undergoing offline testing. Remote-viewing and data-collection software are also under development.

Later this year, a new MD2 microdiffractometer from Accel will be installed on Beamline 8.2.1. The MD2 is designed for working with small crystals; it is capable of high-resolution crystal imaging, and the integrated beam collimation devices will define the beam of a desired size with minimized air scatter.

Next year will be devoted to upgrading the optics on Beamline 8.2.1, which will extend its capacity to the limits of the technology, with the goal of decreasing the spot size from 100 to 30 microns and increasing the beam brightness by a factor of 5. An internally cooled Si design was chosen for the front-end parabolic mirror as it gives the best thermal performance of the options available. The second mirror will be replaced with one of the same design as is currently used, but with a lower slope error. The monochromator upgrade will include the addition of multilayer crystals, which will give the option of higher flux at lower resolution (similar to the existing

monochromator on 12.3.1), and direct liquid-nitrogen cooling of crystals, which will reduce thermal distortions by more than a factor of ten.

These beamlines have grown tremendously since their commissioning in 2003, becoming two of the most productive crystallography beamlines at national synchrotron light sources. This upgrade, which is funded by the Howard Hughes Medical Institute, will ensure that they continue at their high level of operation.

4. GROUNDBREAKING CEREMONIES FOR USER SUPPORT BUILDING AND GUEST HOUSE

(Contact: Jeff Troutman, jptroutman@lbl.gov)

This year's ALS Users' Meeting will feature two official Laboratory groundbreaking ceremonies in two days, unprecedented in the history of Berkeley Lab. All ALS and Laboratory staff are invited.

On Thursday, October 4, at 12:15 p.m., the groundbreaking ceremony for the ALS User Support Building will take place on the Renner Deck next to the building site west of the ALS. The 30,000-square-foot, three-story structure, to be funded by DOE's Office of Basic Energy Sciences, will offer modern experimental staging and assembly space, support laboratories, and offices.

The next day, the Laboratory will host the groundbreaking ceremony for the Berkeley Lab Guest House (12:00 noon on the site of the new structure, west of Building 2). Located within a short walk of the ALS and the cafeteria, the Guest House will provide 70 beds in single- and double-occupancy rooms and will include a main lobby, lounge areas, a fitness center, laundry, vending areas, and an outdoor patio. Funding for the Guest House will be provided through external financing, and expenses will be covered by revenues collected for room rentals, vending, and sales. The Howard Hughes Medical Institute has provided a generous grant for furniture, fixtures, and equipment.

The late Gary Krebs, ALS User Services Group Leader from 1998 to 2007, worked tirelessly on plans for the Guest House. Members of his family are among those expected to attend.

5. UEC CORNER: ALS USERS' MEETING UPDATE

by Tony van Buuren

(Contact: Tony van Buuren, vanbuuren1@lbl.gov)

For the first time, the Users' Meetings of the Advanced Light Source and the Molecular Foundry are being organized jointly and simultaneously. The meeting will be held on October 4-6. At the meeting there will be a joint plenary session, a joint poster session, and several joint workshops. We hope to stimulate strong interactions between the two user communities. The ALS meeting co-chairs, Peter Fischer and Ken Goldberg, together with Jeff Bokor from the Molecular Foundry, have put together an exciting program highlighting scientific achievements at these

facilities and looking toward the future. More information on the Users' Meeting can be found on the Web site (<http://www-als.lbl.gov/als/usermtg>).

Also, it is time for the annual election of new members to the ALS Users' Executive Committee. Please take a moment to look at the UEC Election Web site (<http://www.als.lbl.gov/als/uec/vote/nominations.html>) and nominate suitable candidates from the ALS community who would be willing to serve. If you have any questions, please contact me or any other UEC representative. I look forward to meeting many of you at this year's meeting.

6. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs scheduled between August 28 and September 24 (including the first week of two-bunch user operations), the beam reliability (time delivered/time scheduled) was 89.1%. Of the scheduled beam, 85.0% was delivered to completion. Problems with the injection system (resulting in slow storage-ring refills) were the cause of most of the lost beam time.

Long-term and weekly operations schedules are available on the Web at <http://www-als.lbl.gov/als/schedules/index.html>. Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at <http://www-als.lbl.gov/als/status/>.

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LBNL/PUB-948 (2007)

Editors: jmccullough@lbl.gov, Istamura@lbl.gov, ejmoxon@lbl.gov

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Current issue online at http://www-als.lbl.gov/als/als_news/

1. THE 2007 ALS USERS' MEETING: A UNIQUE SHARED EVENT

(Contact: Julie McCullough, jmccullough@lbl.gov)

This year's ALS Users' Meeting, held on October 4-6, was the first joint ALS/Molecular Foundry event, with a variety of shared activities, including plenary and poster sessions, a student poster competition, 3 of the 12 workshops, and a banquet. Another first was the dedication of two major facilities--the ALS User Support Building and the Berkeley Lab Guest House. In addition, a special session honored the memory of ALS User Services Group Leader Gary Krebs. All told, 616 people attended, 396 from the ALS and 220 from the Molecular Foundry. Thanks go to program co-chairs Peter Fischer and Ken Goldberg for organizing this highly successful ALS Users' Meeting.

Read the full story at

http://www-als.lbl.gov/als/als_news/news_archive/vol.281_103107.html#1

2. SURPRISING QUASIPARTICLE INTERACTIONS IN GRAPHENE

(Contact: Eli Rotenberg, ERotenber@lbl.gov)

Until now, the world's electronics have been dominated by silicon, whose properties, while excellent, significantly limit the size and power consumption of today's computer chips. In order to develop ever smaller and more efficient devices, scientists have turned their attention to carbon, which can be formed into nanostructures like nanotubes, whose properties can be tuned from metallic to semiconducting. However, using carbon nanotubes for complex circuits is nearly impossible because their location and functionality in devices cannot be controlled at will,

making them a poor substitute for silicon. Graphene, however, does not have these limitations. This single sheet of carbon atoms that is the building block of carbon nanotubes, C60 molecules, and graphite turns out to have similar functionality but with the added benefit that it can be grown with conventional methods and patterned into devices. Now, a group of scientists from Germany and the ALS, using angle-resolved photoemission spectroscopy (ARPES) at ALS Beamline 7.0.1, have succeeded in making the first measurement of the carrier lifetime in graphene over a wide energy scale and have found surprising new interactions that suggest new kinds of devices.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/154graphene.html

Publication about this research: A. Bostwick, T. Ohta, Th. Seyller, K. Horn, and E. Rotenberg, "Quasiparticle dynamics in graphene," *Nature Physics* 3, 36 (2007).

3. WORKSHOP ON "SCIENCE FOR A NEW CLASS OF SOFT X-RAY LIGHT SOURCES": A ROUSING SUCCESS

by Bill McCurdy

(Contact: Bill McCurdy, CWMcCurdy@lbl.gov)

Roughly 80 scientists from the U.S., Canada, Europe, and Japan participated in a workshop on October 8-10 on the subject of "Science for a New Class of Soft X-Ray Light Sources." Ten plenary talks were followed by intense discussions in breakout groups on science in the general areas of atomic, molecular, and optical physics; chemical physics; correlated materials; magnetization and spin dynamics; and nanoscale materials and coherent imaging. The parameters of the class of light sources addressed in the workshop were defined primarily by a maximum photon energy of ~3 keV. The pulse duration could be from attoseconds to picoseconds. The results of this workshop will help to define which parts of this parameter space should be targeted in the design of these sources, as well as what kind of science they would initially address.

To read more, go to the conference web site: <http://hpcrd.lbl.gov/sxls/home.html>

4. THE ALS WELCOMES SUE BAILEY AS USER SERVICES GROUP LEADER

Sue Bailey recently joined the ALS as leader of the User Services Group, which includes the User Services Office, Communications Section, and Experimental Setup Coordination. She brings to her new position over 20 years of scientific, software, and managerial experience. Sue also has the perspective of working at two synchrotron facilities, Daresbury Synchrotron Radiation Source in the United Kingdom and the ALS. At Daresbury, she was the group leader and user point of contact in the European community for a protein crystallography computational project and led her own research team on structure-function relationships of bacterial metalloproteins. She also performed research on enzymes in the sulphur cycle and secretion systems of pathogenic bacteria.

In 2003, Sue came to the ALS for a two-year stint as a beamline scientist in the Berkeley Center for Structural Biology. This evolved into a position as the BCSB's user support manager for the ALS protein crystallography beamlines. Sue returned to England and to Daresbury, but was soon lured back to the Bay Area and the ALS. "I'm pleased and honored to again be part of this world-class facility," she stated. "I have an open-door policy, and all users are welcome to drop in." Sue's office is in Building 6, Room 2212D, within the User Services Office. You can also contact her by email at Sbailey2@lbl.gov or telephone at 510-486-7727.

5. UEC CORNER: USERS' EXECUTIVE COMMITTEE ELECTIONS BEGIN NOVEMBER 1

by Tony van Buuren

(Contact: Tony van Buuren, vanbuuren1@lbl.gov)

Congratulations and many thanks to Peter Fischer, Ken Goldberg, and the ALS staff for organizing a fantastic Users' Meeting! This year's meeting was combined for the first time with the Molecular Foundry and featured a joint plenary session, a joint poster session, and several joint workshops. Highlights and pictures of this year's Users' Meeting can be found on the Users' Meeting Web site at:

<http://www-als.lbl.gov/als/uec/vote/index.html>

Voting for three new Users' Executive Committee (UEC) members and one student representative will begin on November 1 and continue through November 10, 2007. Go to the UEC Elections Web site at <http://www-als.lbl.gov/als/uec/vote/> to vote or view the final slate of candidates and their biographies. All ALS users with current email addresses on file in our user database are eligible to vote. The election results will be posted on the above site after the election. The newly elected members will take office for a three-year term beginning January 1, 2008. They replace those rotating off the committee at the end of this year: Clemens Heske (University of Nevada, Las Vegas), Simon Morton (Berkeley Lab), Jinghua Guo (Berkeley Lab), and Amanda Hudson (University of Nevada, Las Vegas, student representative).

6. PLEASE SUBMIT YOUR PUBLICATIONS, INVITED TALKS, AWARDS BY WEDNESDAY, NOVEMBER 7

(Contact: Ken Winters, ALSPubs@lbl.gov)

We are busy gathering data for our triennial review by the U.S. Department of Energy's Office of Basic Energy Sciences, which will happen early next year. A crucial component of that material is your publications, invited talks, and awards information based on work done at the ALS. Normally we require that you submit this information through our Web form, but from now through November 7 we are offering a special amnesty allowing you to bypass the form and simply email the information to ALSPubs@lbl.gov. You may send attachments or just cut and paste your publications, invited talks, and awards information directly into your email.

-- Be sure to include the beamline on which your research took place.

-- Please DO NOT send duplicates of publications already in our database. To check which publications are already there, visit our Publication Search page at
http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/PublicationSearch.shtml/Initialize

To check which invited talks and lectures are already in the database, visit the Award/Lecture Search page http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/AwardSearch.shtml/Initialize

-- NOTE: If you submit your publications data via the Publications Web site, go to ALS Publications to submit published papers:
http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/PublicationSubmit.shtml/Initialize

Go to Submit an Award or Invited Lecture to submit awards and lectures:
http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/AwardTalkSubmit.shtml/Initialize

7. LET US HEAR FROM YOU

Take the ALSNews Survey. ALSNews debuted almost 13 years ago and since that time has grown to a readership of over 4,000 email subscribers from all over the world. In order to keep up to date with what our readers want, we have compiled a short survey. Please take a minute to fill it out, then click "submit."

http://www-als.lbl.gov/als/als_news/surveys/2007/

8. ALS-RELATED WEB NEWS AND LINKS

Diamondoids: The future on display
<http://www.lbl.gov/Science-Articles/Archive/sabl/2007/Oct/diamondoids.html>

First high-res 3-D structures of mammalian HSP90 protein solved
<http://www.lightsources.org/cms/?pid=1002390>

New high-res structure will boost AIDS, cancer drug development
<http://www.drugresearcher.com/news/ng.asp?n=80816-hauptman-woodward-institute-hsp-grp>

Gold nanoparticles revealed
<http://www.nature.com/news/2007/071018/full/news.2007.178.html>

A golden close-up: Crystal structure of a gold-thiolate cluster reveals surprising surface chemistry
<http://pubs.acs.org/cen/news/85/i43/8543notw4.html>

Structure of the first mammalian GRP94 protein solved
<http://www.topnews.in/structure-first-mammalian-grp94-protein-solved-23516>

21st International Conference on X-Ray and Inner-Shell Processes
<http://x08.spectro.jussieu.fr/>

UC Regents set to approve Berkeley projects
<http://www.berkeleydaily.org/text/article.cfm?issue=10-26-07&storyID=28313>

9. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs scheduled between September 25 and October 28 (including the second week of two-bunch user operations), the beam reliability (time delivered/time scheduled) was 94.5%. Of the scheduled beam, 88.7 % was delivered to completion. There were no significant interruptions.

Long-term and weekly operations schedules are available on the Web at <http://www-als.lbl.gov/als/schedules/index.html> . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at <http://www-als.lbl.gov/als/status/> .

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ALSNews is a monthly electronic newsletter to keep users informed about developments at the Advanced Light Source, a national user facility located at Ernest Orlando Lawrence Berkeley National Laboratory, University of California. The current and past issues of ALSNews are available on the World Wide Web. Point your browser to the following URL:

http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

LBNL/PUB-948 (2007)

Editors: jmccullough@lbl.gov, Istamura@lbl.gov, ejmoxon@lbl.gov

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Current issue online at http://www-als.lbl.gov/als/als_news/

1. DIAMONDOID MONOLAYERS AS MONOCHROMATIC ELECTRON SOURCE (Contact: Wanli Yang, WLYang@lbl.gov)

Diamondoids are nanometer-sized molecules that feature diamond-crystal cage structures. Adamantane, the smallest member in the family, consists of one cage structure, diamantane two, triamantane three, tetramantane four, and so on. On all of these, the dangling bonds on the outer surfaces are terminated by hydrogen atoms. Because of their potential to possess novel properties of both diamond and nanomaterial, intensive efforts have been made to synthesize the larger diamondoid molecules, but to no avail. This situation was finally changed in 2003 when significant quantities of higher diamondoids were found in petroleum by researchers in MolecularDiamond Technologies. Now, scientists from Berkeley Lab, Stanford University, Lawrence Livermore National Laboratory, and Germany have used photoelectron spectroscopy at the ALS to reveal an intriguing feature: monochromatized electron emission from a self-assembled monolayer of diamondoids. This discovery has immediately attracted the attention of people who are searching for materials for next-generation electron emitters.

Read the full story at
http://www-als.lbl.gov/als/science/sci_archive/155diamondoids.html

Publication about this research: W.L. Yang, J.D. Fabbri, T.M. Willey, J.R.I. Lee, J.E. Dahl, R.M.K. Carlson, P.R. Schreiner, A.A. Fokin, B.A. Tkachenko, N.A. Fokina, W. Meevasana, N. Mannella, K. Tanaka, X.J. Zhou, T. van Buuren, M.A. Kelly, Z. Hussain, N.A. Melosh, and Z.-X. Shen, "Monochromatic electron photoemission from diamondoid monolayers," *Science* 316, 1460 (2007).

2. A FIRST LOOK AT YEAST FATTY ACID SYNTHASE

(Contact: Yong Xiong, Yong.Xiong@yale.edu)

Fatty acids are the major constituents of eukaryotic and bacterial cellular membranes. They are used for functionally important post-translational protein modifications, and chains of fatty acids are the main storage compartments of an organism's chemical energy. Fatty acid synthesis is carried out by fatty acid synthase (FAS), which catalyzes cycles of multistep chemical reactions that are essentially the same in all organisms. FAS uses one acetyl-coenzyme A (CoA) and seven malonyl-CoA molecules to synthesize the 16-carbon palmitic acid, the most abundant fatty acid in eukaryotes. Now, for the first time, a group of researchers has determined the atomic structure of yeast *Saccharomyces cerevisiae* FAS derived from two crystals of the enzyme, using data collected at ALS Beamlines 8.2.1 and 8.2.2, as well as other synchrotron facilities.

Read the full story at

http://www-als.lbl.gov/als/science/sci_archive/156FAS.html

Publication about this research: I.B. Lomakin, Y. Xiong, and T.A. Steitz, "The crystal structure of yeast fatty acid synthase, a cellular machine with eight active sites working together," *Cell* 129, 319 (2007).

3. UEC CORNER: THE VOTES ARE IN!

by Tony van Buuren

(Contact: Tony van Buuren, vanbuuren1@llnl.gov)

I would like to thank the ALS users community for voting in this year's ALS Users' Executive Committee (UEC) election. Voting started slowly but ended on a strong note after a number of encouraging get-out-the-vote emails from the UEC and ALS staff. At this time, the election results are in and we will welcome four new members next year: Yves Acremann (Stanford Linear Accelerator Center); Phil Heimann (Berkeley Lab); Wayne Stolte (University of Nevada, Las Vegas); and the new student representative, Anne Sakdinawat (UC Berkeley and UC San Francisco).

The newly elected members will take office for a three-year term beginning January 1, 2008. UEC vice chair Hendrik Ohldag (Stanford Linear Accelerator Center) will take over as chair, and I will serve as an ex-officio UEC member in 2008. Read more about new UEC members and continuing members on the ALS-UEC Nominating and Voting Web site (<http://www-als.lbl.gov/als/uec/vote/>).

4. ALS SCIENTISTS HONORED

Three ALS scientists were recently honored for their scientific achievements, one with an award and two with fellowships.

Chuck Fadley, ALS long-time user and a physicist with Berkeley Lab's Materials Sciences Division and at UC Davis, was presented last month with an award from the Japanese Society for the Promotion of Science for his development of characterization methods based on photoelectron spectroscopy and synchrotron radiation and for his mentoring of young scientists. Chuck received the award while attending the Sixth International Symposium on Atomic-Level Characterization for New Materials and Devices in Kanazawa, Japan. He is one of the world's foremost practitioners of photoelectron spectroscopy.

Last month, the American Association for the Advancement of Science (AAAS) announced the election of its 2007 fellows. ALS Deputy Division Director Ben Feinberg was one of the five Berkeley Lab scientists selected for this honor. AAAS fellows, a tradition that began in 1874, are chosen by their peers for their distinguished contributions to science research, teaching, technology, or administration. Ben was elected "for outstanding contributions to user facilities, especially the Advanced Light Source." Ben and the other new fellows will be recognized for their contributions at the Fellows Forum on February 16, 2008, during the AAAS Annual Meeting in Boston. See the November 16, 2007, issue of The View for a complete list of Berkeley Lab honorees: <http://www.lbl.gov/Publications/Currents/archive/index.html#13>

Howard Padmore, ALS Division Deputy for Experimental Systems, has been elevated to the rank of fellow by the Optical Society of America (OSA) Board of Directors at their meeting in September in San Jose, California. OSA members who have served with distinction in the advancement of optics are eligible for nomination to the rank of fellow. The number of fellows is limited to ten percent of the total membership. The Society recognizes Howard for his pioneering contributions to the application of x-ray optics to scientific research using synchrotron radiation.

5. ALSNEWS SURVEY RESULTS

by Julie McCullough

(Contact: Julie McCullough, jmccullough@lbl.gov)

Last month we asked our readers to fill out a short survey. We've tallied the results, and they appear on the ALSNews Web site:

http://www-als.lbl.gov/als/als_news/news_archive/vol.282_112807.html#5

Thanks to all of you who responded. We welcome your feedback at any time. Send comments to alsnews@lbl.gov.

6. Call for general user proposals: Due January 15, 2008

(Contact: alsproposals@lbl.gov)

The User Services Office is accepting general user proposals from scientists who wish to conduct research in the general sciences at the ALS during the running period from July through December 2008. The deadline for submissions is Tuesday, January 15, 2008. (This deadline does

not apply to protein crystallography proposals, which have a separate process and schedule.) To submit a new proposal, go to the online form, "ALS General User Proposal and Request for Beamtime," at:

http://alsusweb.lbl.gov/4DCGI/WEB_GetForm/Page1P.shtml/Initialize

The following resources are available for further information:

ALS User Services Administrator
alsuser@lbl.gov

General user proposals
<http://www-als.lbl.gov/als/quickguide/independinvest.html>

ALS User Services online forms
<http://alsusweb.lbl.gov/>

Beamline and contact information
http://www-als.lbl.gov/als/als_users_bl/bl_table.html

7. The 2006 ALS ACTIVITY REPORT IS NOW AVAILABLE

The 2006 ALS Activity Report is now available. Go to the Activity Reports archive page (<http://www-als.lbl.gov/als/actrep/>) to download a PDF copy. For more information on obtaining a printed copy, see "Obtaining Printed Copies of ALS Publications" on the ALS Publications Web page:

<http://www-als.lbl.gov/als/publications/index.html>

8. ALSNEWS HOLIDAY SCHEDULE

ALSNews will be taking the month of December off. We will return in the new year with our January 30, 2008, issue. Have a happy and safe holiday!

9. ALS-RELATED WEB NEWS AND LINKS

Brightening Science's Future
<http://sciencematters.berkeley.edu/archives/volume4/issue33/story1.php>

University of Colorado Solves the Structure of a Neuronal Calcium Sensor Protein Using the Fluidigm TOPAZ System
<http://www.genengnews.com/news/bnitem.aspx?name=27288572>

Measles Structure Offers Drug Design Guide
<http://www.lightsources.org/cms/?pid=1002464>

Researchers outline structure of largest nonvirus particle ever crystallized
<http://www.lightsources.org/cms/?pid=1002475>

Pollution in China could impact our air
http://abclocal.go.com/kgo/story?section=global_warm&id=5747398

Advanced Photon Science Initiative: Into the future at the speed of light
<http://www.lbl.gov/Publications/Currents/archive/index.html#1>

Smallest double slit experiment:

The world's smallest double slit experiment: Breaking up the hydrogen molecule
<http://www.lightsources.org/cms/?pid=1002448>

Young's experiment performed in a hydrogen molecule
<http://www.sciencedaily.com/releases/2007/11/071115164358.htm>

Line between quantum and classical worlds is at scale of hydrogen molecule
<http://www.sciencedaily.com/releases/2007/11/071109090639.htm>

10. OPERATIONS UPDATE

(Contact: Dave Richardson, DBRichardson@lbl.gov)

For the user runs scheduled between October 31 and November 20, the beam reliability (time delivered/time scheduled) was 88.9%. Of the scheduled beam, 82.4% was delivered to completion. Failure of a circuit board in the SRRF system on November 14 resulted in the loss of approximately 26 hours of scheduled beam time.

Long-term and weekly operations schedules are available on the Web at <http://www-als.lbl.gov/als/schedules/index.html> . Requests for special operations use of the "scrubbing" shift should be sent to Rick Bloemhard (ALS-CR@lbl.gov, x4738) by 1:00 p.m. Friday. A Web page showing the ring status in real time can be found at <http://www-als.lbl.gov/als/status/> .

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http://www-als.lbl.gov/als/als_news/

To subscribe, unsubscribe, or change your delivery address for the email version of ALSNews, send a message indicating your wishes and including your name and email address to alsnews@lbl.gov. We welcome suggestions for topics and content.

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